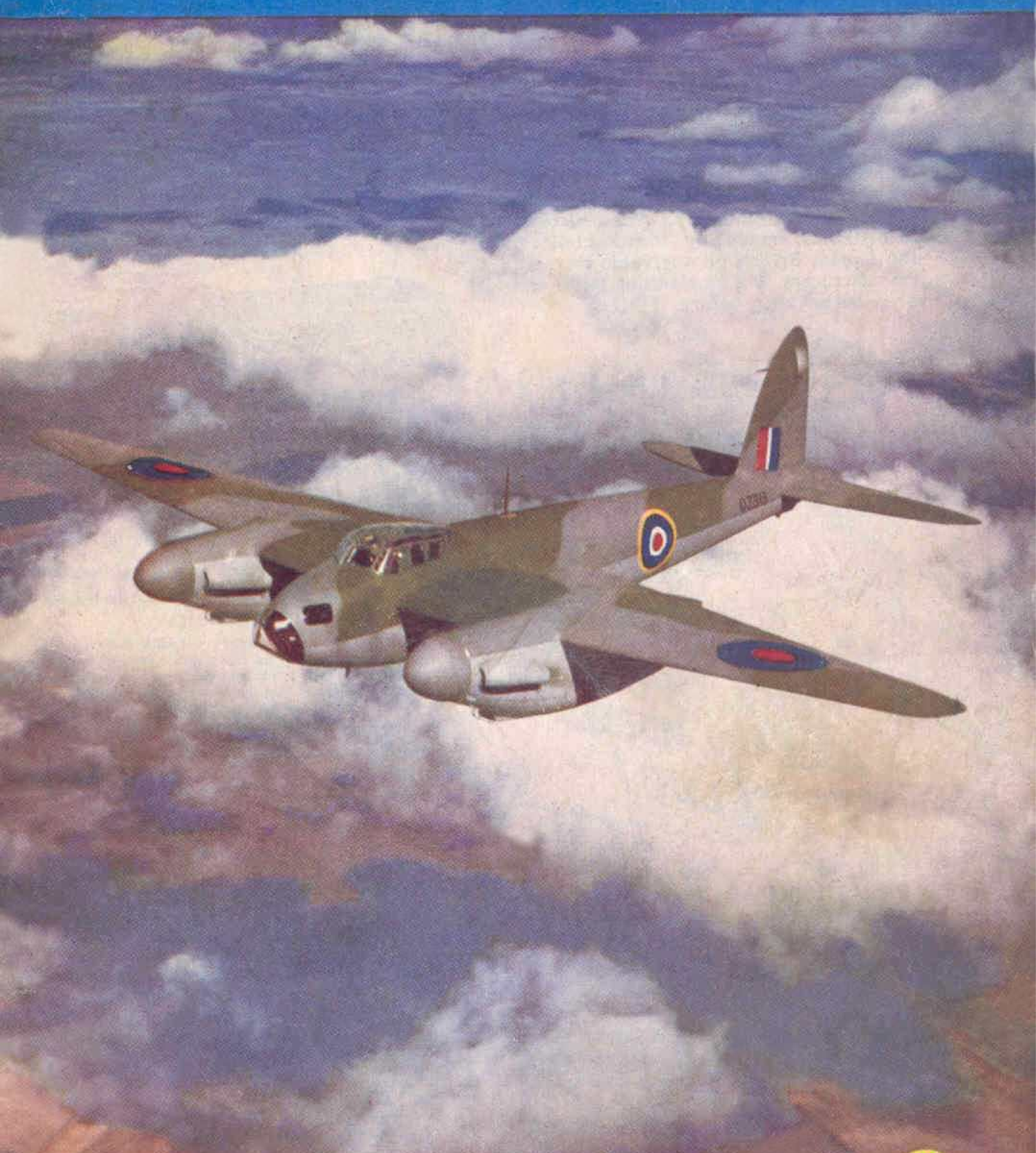
VOL. XXVIII. No. 4 APRIL 1943

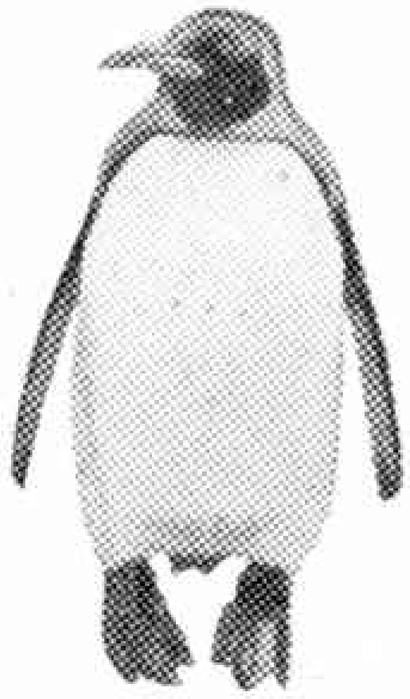
MECCANO MAGAZINE



THE "MOSQUITO" BOMBER

6D.

"where's this fish queue ?"



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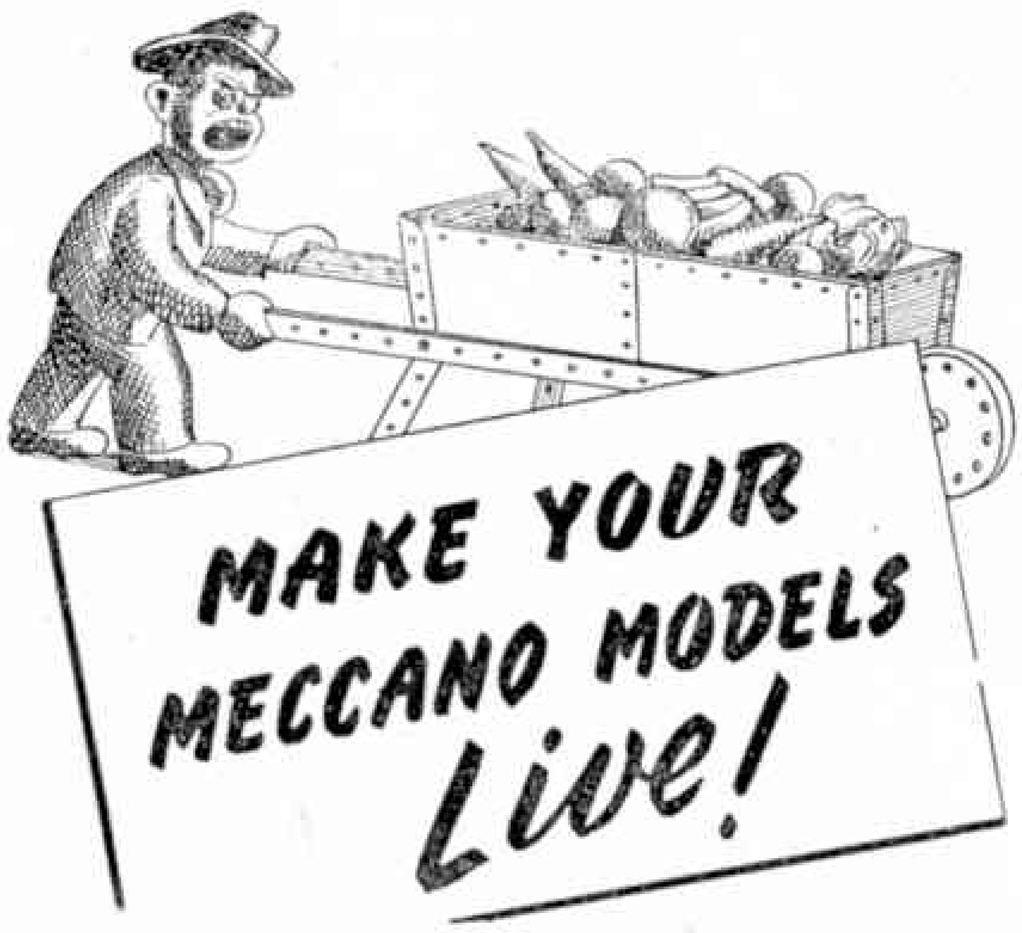

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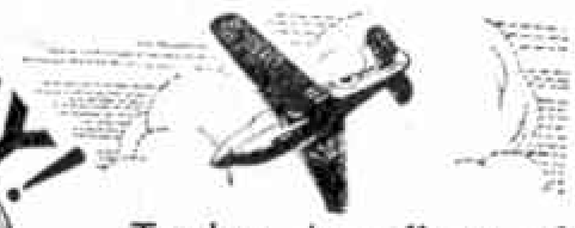

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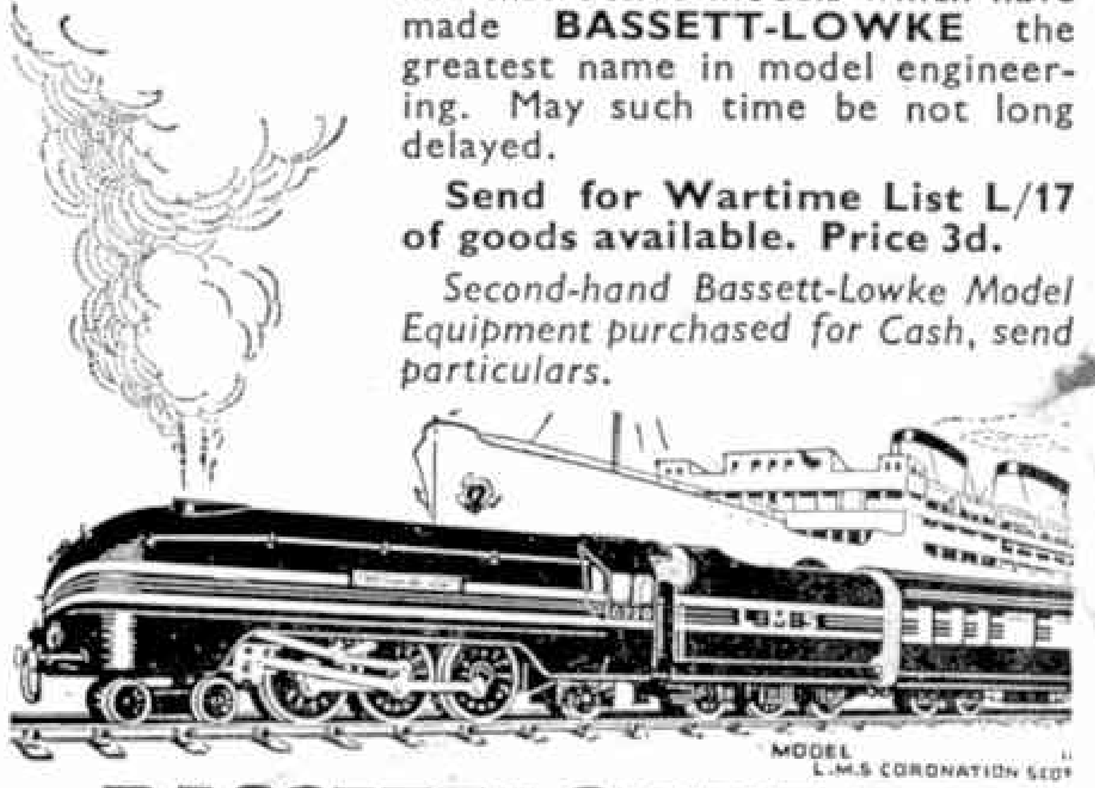

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LOOK AT THAT PLANE STUNTING UP THERE
IT ISN'T STUNTING IT'S OUT OF CONTROL I THINK
1
4
THANKS, SIR, BUT MY B.S.A IS AS GOOD AS NEW
FINE BIKES, THOSE B.S.A.
I'D LIKE TO BUY YOU A NEW BICYCLE FOR WHAT YOU HAVE DONE, OLD CHAP.
2
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April 1943

With the Editor

Awkward Questions

Most of us have had the experience of being temporarily stumped by a simple question about a subject on which we rather fancied ourselves as experts. Sometimes such questions are, as a friend of mine puts it, "just daft"; but often they are quite sensible and need a gathering of our wits to answer fully. Next month I am going to start a series of questions of this kind, with suitable answers, under the heading: *"Have You Ever Thought About This?"* I shall be glad to hear what readers think of this new page, and to receive suggestions for further questions.

I am sure all readers will enjoy the article *"O.K. for Flight"* on pages 112-114. I found it so refreshing that I decided to leave it just as the author passed it over, with all its American phrases and spelling.

* * * *

I have been informed by the Secretary of State for the Colonies that, according to a telegram received from Tokio through the International Red Cross, 4050, Sapper B. F. Barton, Hong Kong Volunteer Defence Corps, is a prisoner of war in Hong Kong.

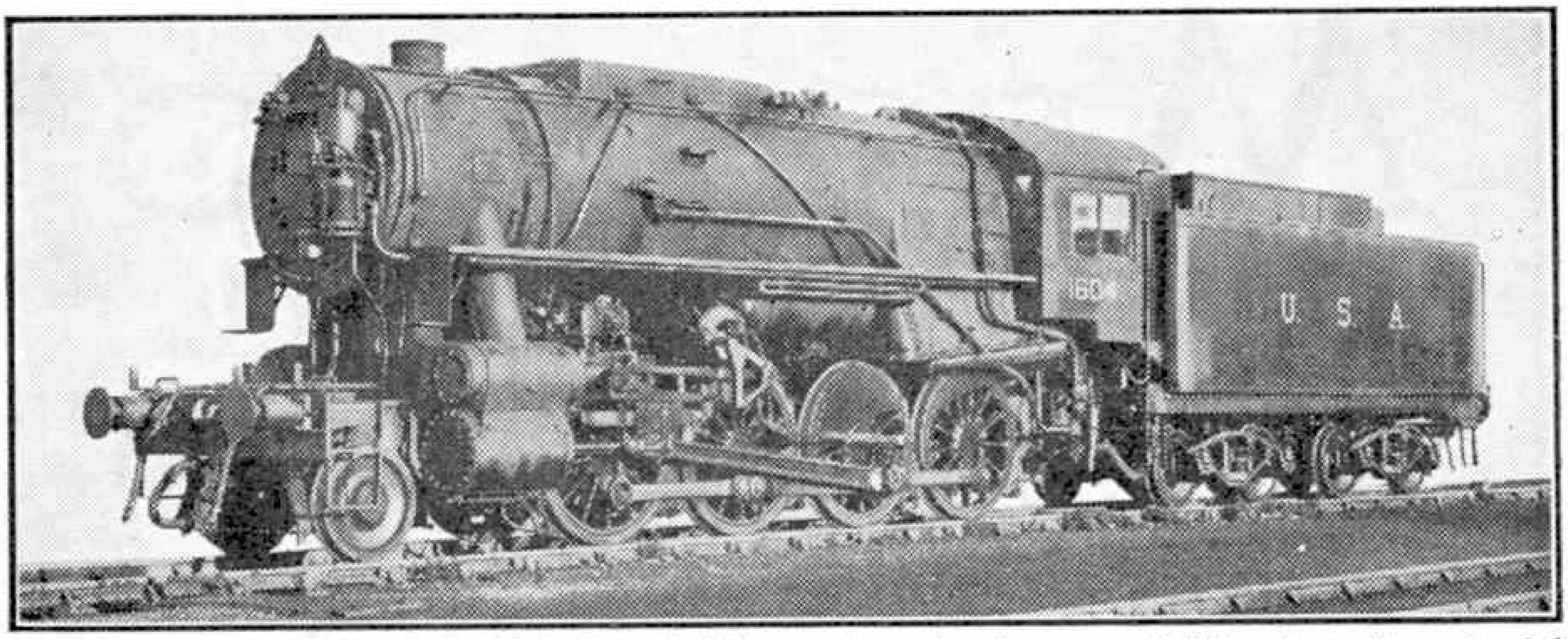
Leaders in the War

Sir Keith Rodney Park

Air Vice-Marshal Sir Keith Rodney Park was born in 1892 and educated at Otago Boys' High School, Dunedin, and King's College, Auckland, New Zealand. He was a fighter pilot in the 1914-18 war, has been Air Attaché at Buenos Aires, and A.D.C. to the King. In the present war he has already played a very distinguished part. He was at the evacuation at Cherbourg, where he carried out the last fighter patrol; and he directed the air operations against the Luftwaffe during the evacuation at Dunkirk, from which his machine was the last to leave. At the time of the Battle of Britain he was in command of the famous No. 11 Group, Fighter Command, which was responsible for the defence of London and the South-East, and bore the brunt of the very great Nazi air attacks.

Air Vice-Marshal Sir Keith Rodney Park, K.B.E., C.B., M.C., D.F.C., Air Officer Commanding R.A.F., Mediterranean.

In 1941 he was sent to the Middle East as Air Officer Commanding, R.A.F., Egypt. He left this post in July 1942 to take up his present appointment of Air Officer Commanding, R.A.F., Mediterranean, with headquarters at Malta.



No. 1604, the first American-built 2-8-0 "Austerity" locomotive under steam on a British railway. It was handed over to Lord Leathers, Minister of War Transport, at Paddington. Photograph by courtesy of the G.W.R.

The New 2-8-0 "Austerity" Locomotives

A Simple Design for War Work

NEW 2–8–0 locomotives that have been built for the Ministry of Supply in Great Britain and in America have aroused considerable interest. These are of simple and robust design, in which every detail has been worked out to ensure economy in labour and material, together with ease in maintenance and repair; in consequence they have been given the name of "Austerity" locomotives. They are suitable for use on any 4 ft. 8½ in. gauge railway in the world, and are capable of hauling loads of 1,000 tons. They will be used for heavy goods trains and military traffic of various kinds.

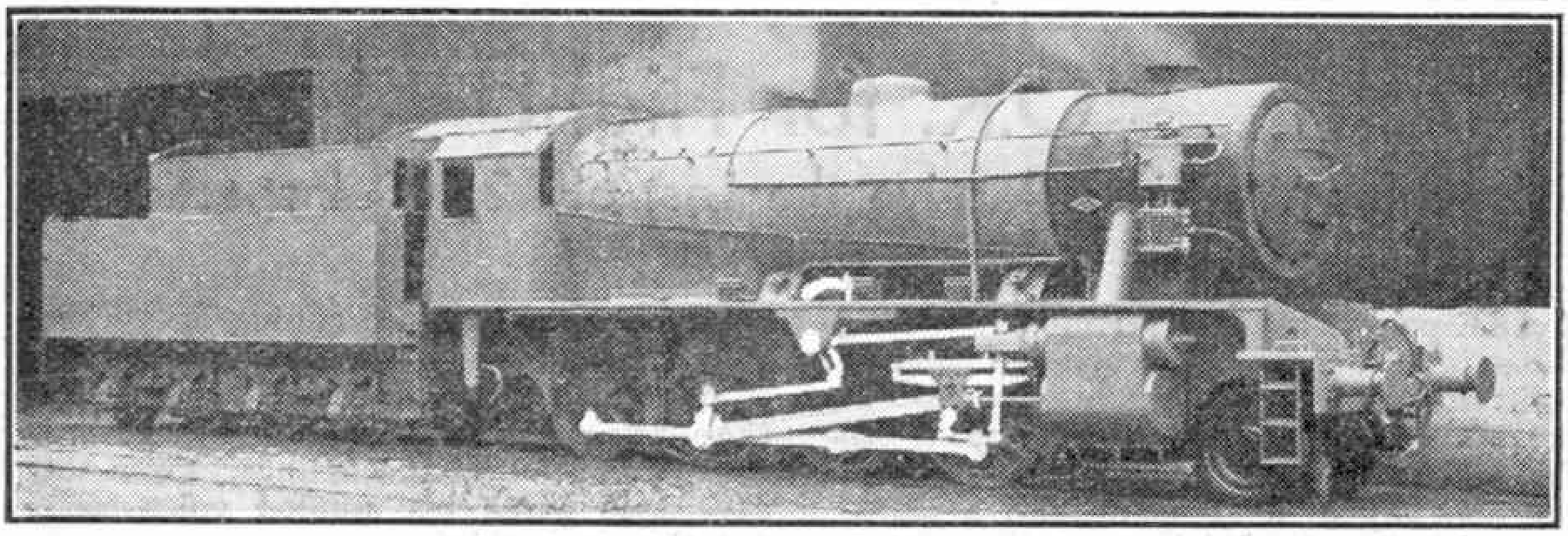
The British-built "Austerity" locomotive is illustrated at the top of the opposite page. It has many features that are of unusual appearance for British railways, including a stumpy stovepipe chimney, a boiler with a barrel of larger diameter than the smoke-box, and a cab of shape that is unfamiliar to British eyes. The tender also is of unusual form, as our illustration shows, with the coal bunker standing well up above the water tank.

There are two outside cylinders, of 19 in. diameter and 28 in. stroke, that drive the third pair of coupled wheels. Cast-iron box pistons are used, each with three narrow piston rings, and Walschaerts motion is used for actuating piston valves placed above the cylinders. The valves are controlled by hand-screw reversing gear arranged for left-hand drive. The coupled wheels have a diameter of 4 ft. 8½ in. The driving wheel centres take the form of steel castings, but those of the leading, intermediate and trailing wheels are of cast iron, with balance weights incorporated in the castings. It is noteworthy that the use of steel castings and complicated forgings has been strictly limited throughout the engines, and an interesting feature is that renewal parts are duplicate with those of L.M.S. standard 2–8–0 locomotives as far as possible.

The boiler is of the parallel-sided type, and the fire-box casing is round-topped. The inner fire-box is of copper, with a grate area of 28.6 sq. ft. The fire-box heating surface is 168 sq. ft., and the evaporative heating surface altogether amounts to 1,680 sq. ft. The superheating surface is 338 sq. ft., thus giving a total heating surface of 2,018 sq. ft. The boiler pressure is 225 lb. per sq. in., and the tractive effort at 85 per cent. of this is 34,215 lb.

The cab is built up of steel plates with joints so arranged that it can easily be dismantled. It has hinged windows in front, and an opening cut in the sides, but sliding windows or shutters are not fitted there. Seats are provided for the driver and fireman. The tender has eight wheels, without bogies, like that of the L.N.E.R. "Pacifics." Its water capacity is 5,000 gal., and it holds nine tons of coal.

The weight of the engine in working order is 72 tons, and that of the tender 56 tons, giving a total of 128 tons, with an adhesion



A general view of the British-built 2-8-0 "Austerity" locomotive described in this article. Illustration by courtesy of the "Railway Gazette."

weight of 62 tons. It is interesting to find that the 2–8–0 locomotive standardised for similar use at home and overseas during the last war was considerably less powerful, its tractive effort being 31,325 lb., although its weight in working order was only slightly less at 121½ tons.

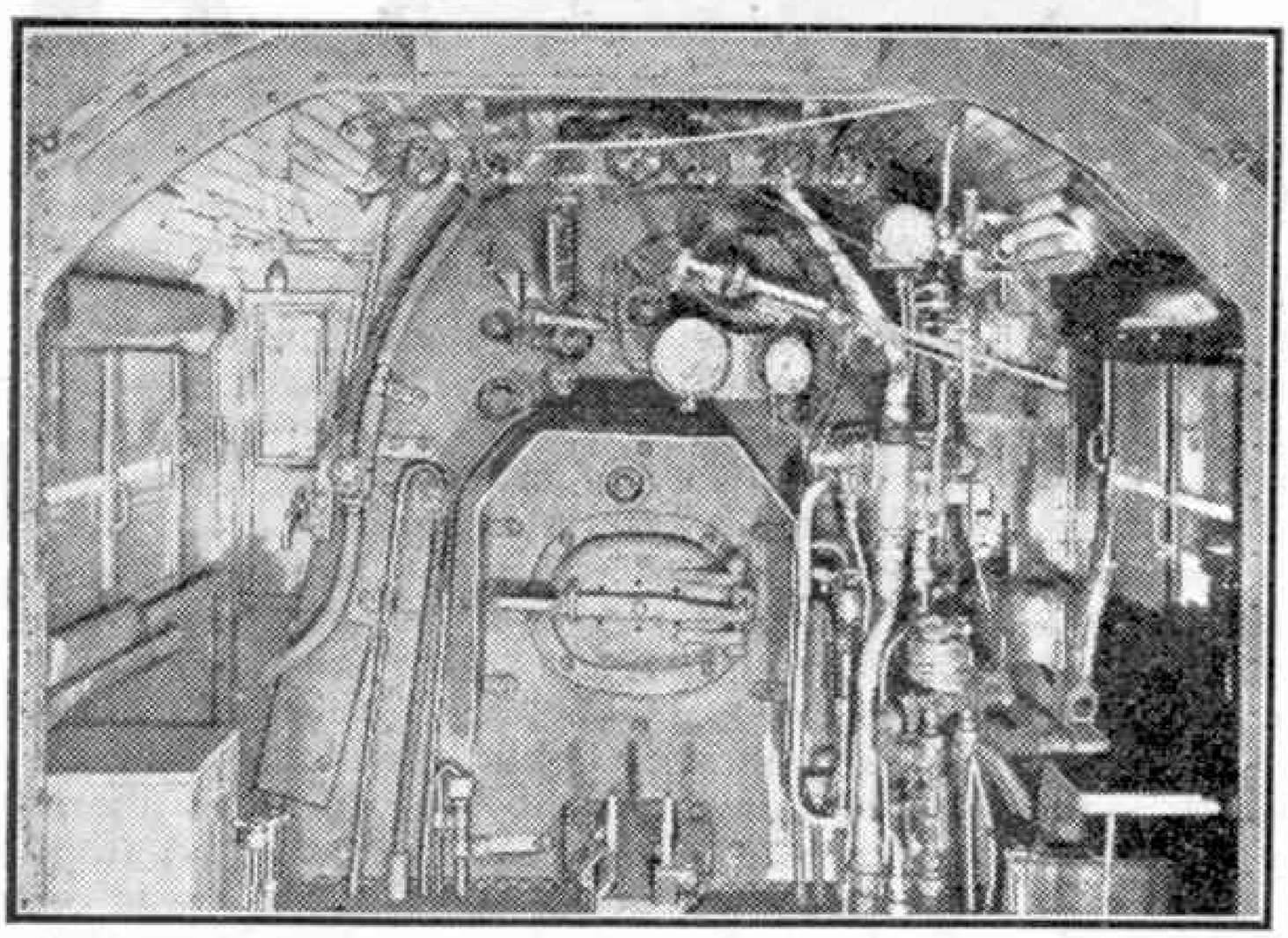
The engines have two pop safety valves, a horizontally-placed whistle and two injectors. Steam brakes are used on the engine, and both Westinghouse and the vacuum automatic brakes are fitted for train working. Certain of the engines are being equipped with means of heating passenger coaches by steam.

The new engines are of good appearance and easy to handle, and all important parts are open to examination without special facilities. Every part indeed is accessible without the removal of large components.

The American-built version of the Ministry of Supply "Austerity" locomotive strikes a new note on British railways. It has been built to conform to the British loading gauge, which is less than that of United States railways, but it has many American features. The frames are of the bar type instead of the plate type usual in this country, and their use has allowed the incorporation of a fire-box with a wide grate, giving an area of 41 sq. ft. against the 28.6 sq. ft. of the British-built engine. The inner fire-box is built of steel plates instead of copper. The smoke-box too is American in style, and has a removable front plate and a small hinged circular door, leaving room for the air compressor, which in the British-built version is mounted on the off side.

Other differences between the two locomotives are that the stroke of the American-built engine is 26 in., against the 28 in. of the British example, and that the controls are arranged for right-hand drive. In front of the cab, on the left side, is a door through which access is given to the high running platforms on each side of the engine. American practice is seen too in the position of the sand boxes, which are on top of the boiler barrel, under the same casing as the dome. The water capacity of the tender is 6,500 gals. and its coal capacity 10 tons, and a further interesting point is that the tender is carried on two four-wheeled bogies.

The locomotive is adaptable for either coal or oil.



In the cab of the American version of the 2-8-0 "Austerity" locomotive. This is arranged for right-hand drive. Photograph by courtesy of the G.W.R.

O.K. for Flight

Douglas Warbirds Receive the Last of 12,000 Inspections

By Tom Elwood

LIKE pooled trout imperceptibly finning an inflowing riffle, the anchored balloons point uniformly into the faintest of eastern breezes stirring beneath the overcast. To the west, I note, stepping briskly from the doorway of field operations, a morning mist lies fog-thick over the water. Outside I join Jacques Gaspardeau, who stands shivering against the hangar wall with the remoteness of 6,000 homesick miles in his Gallic eyes.

Together we walk toward field pre-flight, where bombers fresh from overnight assembly are widely dispersed for final test and delivery. Beyond a brief "Bon jour" he does not speak. A sometimes taciturn gentleman is Jacques, though not unfriendly, no.

His brother was a captain in the French army. So was Jacques —a pilot—but three years ago it became his duty to inspect our bombers for the French government. Now Jacques represents Douglas Aircraft company as final flight inspector.

When, after the successful test flight, the last-minute operational snags are ironed out, an American Army Air Force representative gives the O.K. that Jacques formerly gave—and this time no plane will rust away at Martinique. Not that Jacques was ever to blame.

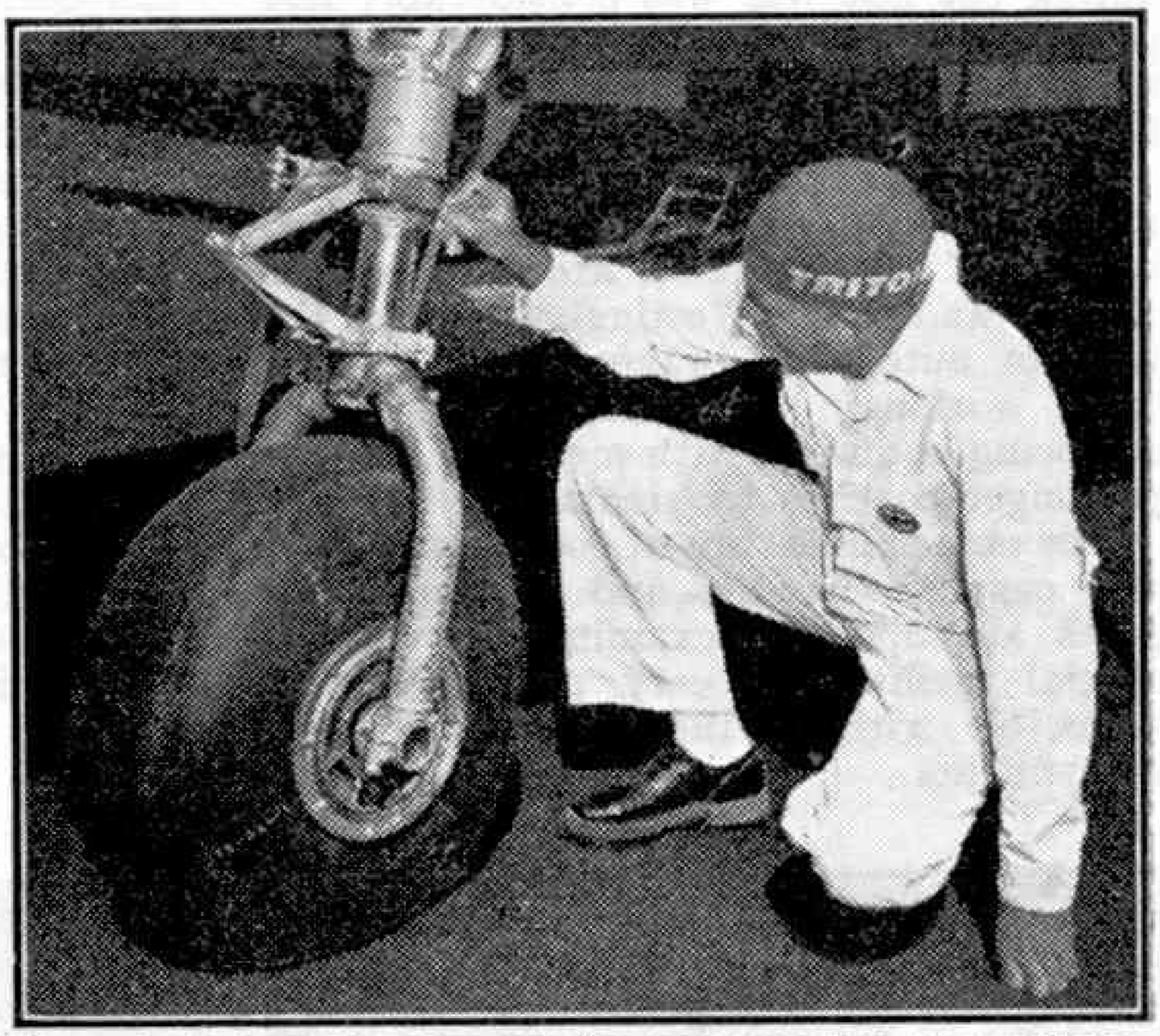
We halt before Ship 121, warming up midfield. Seeing Jacques, the crew chief shuts off the motors, their throaty roar subsiding into quiet broken only by the tick of metal cooling.

Across the field, Wyatt Manley's ship is taxiing. Wyatt is one of our test pilots—the one who is to fly 121 when we've readied it. Just now he's training cadets who've never handled a two-engine ship before. Nevertheless, with each run they itch to keep on going, and back seat driving them up and down the runways is a real chore, I'll bet.

Jacques unhooks the flashlight and looking glass of his trade—the latter stick-mounted like an oversize dental mirror—and begins his professional prowl. First he peers into the gaping nose-wheel tunnel, then explores the nacelles by climbing the big wheels to better check the dark entrails of nested pulley, rod, hose, valve, pump and fittings. From this cavernous perch his muffled voice seeks out the crew chief.

"Left and right-hand struts leak at packing nut. Sorry."

The crew chief has two of his men drain the hydraulic fluid, red as wine. It gushes over tires and puddles the ground. With



Nose wheel shock absorber gets the once-over from Iven Widner. Every ship's hydraulic system must work perfectly before the final O.K. is stamped final inspection.

rags from a toolbox towed on wheels, a crewman wipes off the tires with cleaning solvent from a bottle. We push the ship back a foot or so to clear the puddle-rot.

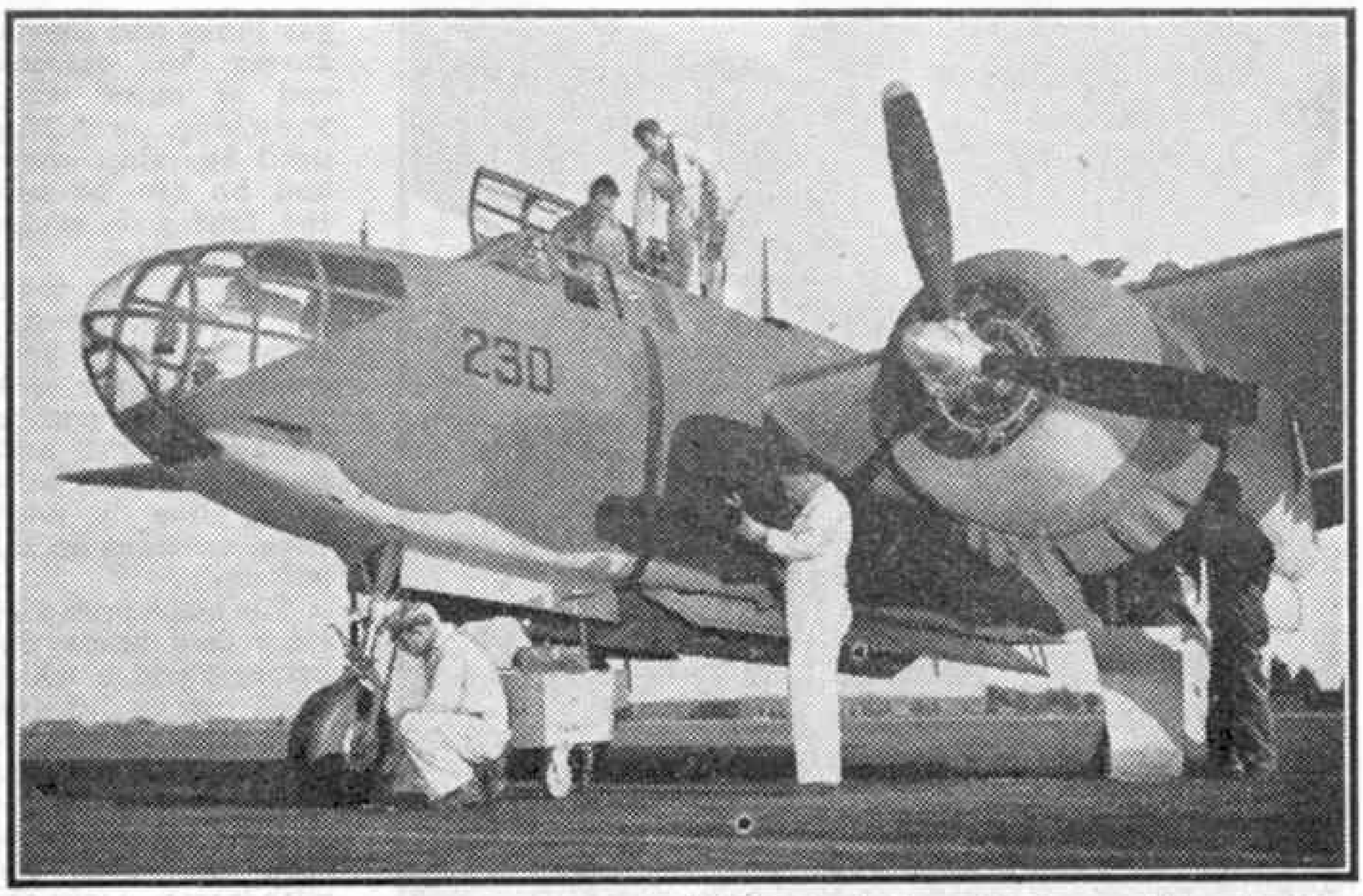
While they're tinkering with hydraulics. Jacques ducks under the bomb bay and rear gunner's cockpit to climb up the fuselage via retractable hand and foot holds. He avoids the "No Step" wing areas, keeping within the space marked in red lines, and lifts the gas tank fillers' cover plates—nifty gadgets adapted from the captured Messerschmitt that was on display last year. After a close inspection of all four wing tanks, he clambers forward into the pilot's cockpit and lets himself down into the seat.

I crouch in the radio enclosure behind him and look on as he tries the controls. Instruments fill the cockpit in front of him, on both sides, and behind to left and right.

The crew chief climbs up. I step out on the wing and let him by.

"Check the nose, will you?" Jacques calls after me.

I feel my way down the two long steps and drop to the ground. Forward, I pull myself into the compartment via the



Inspectors and mechanics swarm over an A-20C fresh from final assembly, checking it out for its first flight.

bombardier's seat-and-floor which, when pulled down, forms a ladder.

The single final inspection card is there. It is a final replacement for dozens of cards filled with items stamped by inspectors in such assembly departments as hydraulics, electrical, instrument, inner wing, fuselage, minor sub-assembly, major sub-assembly and final.

Those cards, in turn, had replaced the hundreds of inspections recorded at each stage of fabrication on the multitude of parts that went into the ship. So that it requires no strain on my credulity to accept the statistician's grand total of some 12,000 inspections for each bomber. And that explains, too, why Wyatt Manley and the rest of our pilots have taken aloft literal thousands of planes without incident or casualty.

Notwithstanding all this painstaking and scrupulous check system, there usually is attached to the final inspection card a "squawk sheet." This plane is no exception, and the following imperfections and oversights are listed for "cure":

"Pilot's seat not installed, due to shortage of seat rails.

"Several screws in R.H. rudder tab cover plate are too short.

"Air brake control nameplates missing."

The first two items have been through the fix-up and accepted by inspection, as indicated by stamp. But the nameplates must be attended, pronto. Getting them, and anything else in shortage, is my job as project man in production control.

Before that, however, I must check off the inspection card itself. This list, partly typed, reads:

"Starter crank safety.

"Install pilot's clock.

"O.K. to install armor plate at Sta. 0.

"Inst. fire ext. fuse and screw down cutter head.

"O. K. for flight."

Each item but the last has a date and inspector's stamp to the right. I look around to be sure and see that Station 0 armor plate is in, the clock also, that the starter crank has been safetied, fire extinguisher fuse installed and cutter head screwed down. That leave us "O.K. for flight." Or does it?

I meet Jacques on the ground and we grin, looking up at the sleek dragonfly; here's one job that has no headaches—we hope. I go for the nameplates while he pokes his mirror into the cowling for loose or missing connections aft of the motor. He also makes a fresh check of the landing gear; hydraulics now O.K.

Jacques is at last ready to turn ship over to pilot. So he thinks.

But a final quick once-over up top proves the conclusion hasty. Jacques says something soft—and hard—in French. For the pilot's hatch is giving trouble again. It seems the rod that latches the enclosure refuses to work outward and lock fully.

Crew chief, two men and I swarm up.

"It looked O.K.," crew chief says,

almost plaintively. "It was re-worked, you know; inspection bought it."

"I know." Jacques is sympathetic. But he knows, as do we all, that a hatch not properly secured may whip off in flight, taking radio mast, antenna and maybe some tail fairing along with it. If nothing more serious. But a re-work job will mean an hour's delay—with Wyatt Manley waiting.

Meanwhile, crew chief has been studying the rod carefully.

"Somebody on nightside must have pried the hatch loose when the key maybe jammed. People ought to have more patience. They bent the rod, that's all. That's why it's too short to engage that right catch. We can hammer the bend straight in a jiffy, if you'll buy it?"

"I'll buy, subject to pilot's approval," agrees Jacques.

Chief and crew get busy as a gas truck pulls up, starts pumping into tanks under Jacques' watchful eye.

Now comes Manley, lugging pilot harness, chute and a yellow tablet for writing up flight squawks. He moves on the ship, flashlight in hand.

Manley is a big guy, close to 200. But it is lean poundage. He has an outdoor face, red with the sun it has absorbed through cockpit glass. His chin is stubborn and the nose-bridge looks like that of a prize-fighter.

To our chorused greeting, he merely grunts, calling up to Jacques aloft, "Cockpit?"

"Cockpit," Jacques answers.

"Open all flaps. Put wing flaps down."

"Wing flaps coming down."

Manley reaches up and feels them—hard, pushing, pulling. He doesn't want them to stick on landing. Not that this would bother him, but a hot landing on our runway means burning rubber to stop. That's unpatriotic these days.

Up in the nose, Manley starts slapping the plexiglas to be sure there are no loose panes. There are none. So he tightens the bombardier's map-holder with a small screwdriver from his hip pocket, studies the clipboard with its inspection card and squawk sheet, descends bringing it with him, closes the access door firmly.

Next he is under the nose tunnel, tapping, playing his flashlight. Once in a blue moon the retract gear will fail to lock right. Not this time.

Into the bomb bay he ducks, checking up on battery connections, cross-feed valves and wobble pump.

Meanwhile, the ground crew is walking the props, one man to a blade and three or four full turns. My nameplates are in place and I initial my shortage list as cured. Jacques is waiting in the cockpit. Chief and his men finish work on the hatch.

We are joined by a clerk from sales department with a clipboard, checking items on a list of his own.

As Wyatt Manley ducks back to the gunner's access door and climbs in, the chap who handles the big red mobile tank of fire extinguisher takes position by the left motor.

But first, Manley is actuating the controls, integrated with those of the pilot, from the gunner's seat. We see the surfaces move, ailerons, flaps, rudder, stabilizers. Then Manley's head and shoulders emerge, he locks the sliding hatch and that of the radio immediately forward and motions to Jacques. They meet on the wing where chief and his men, having replaced the now straightened pilot hatch rod, wait for a decision on it.

Jacques explains briefly. Manley nods and turns the handle. He studies the rod and the inside of the handle and the rubber at the hinge. He closes the hatch, opens it, locks and unlocks it again. Will he buy?

He will, nodding, then gets out on the left wing, checking gas tanks and covers; moves to extreme end of outer wing, stretching, crouching until the ship sways and he can be sure the fairing is secure at the fuselage.

Back in the cockpit, Manley arranges harness and pack carefully on the seat, puts scratch pad in front to right and, pencil in mouth sideways, like a dog's bone, switches on the left motor.

The black prop with its yellow blade tips catches; and a whirlwind sucks at us. We back away to tool boxes, step-ladders and other paraphernalia the crew previously has withdrawn. Only the battery cart remains in position beneath the ship's nose. Up through the forward wheel tunnel, its cables conduct the power for starting, so that the plane's batteries will not be drawn upon for this chore and are always available at full charge for emergencies.

Parachutes over shoulders, squawk sheets and radio headphones in hand, Pilots Herman and Hinchey, in typical pilot's garb, stroll out to begin A-20C test flight.

Hearing no backfire, the fireman wheels his extinguisher to the right motor and waits.

That prop whirrs and the motor's thunder is sweet. But not for long.

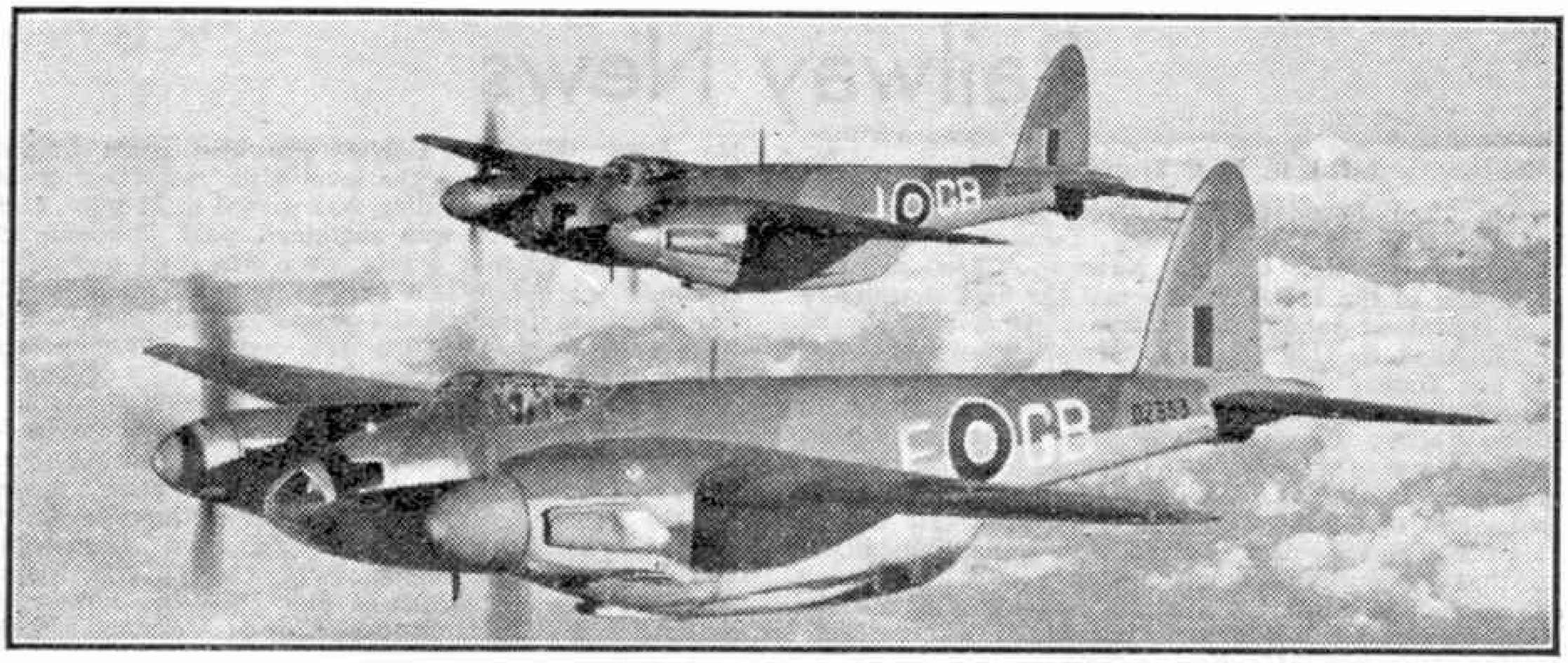
There is a sound like gunfire. The nacelle recoils and a spurt of flame shoots from the cowling. It ignites oil on the ground near main wheel. The big extinguisher spits viciously. The flame dies.

Another roar from the motor. This time no backfire and the fireman backs away.

Now the battery cart is disconnected, pulled away. The red ribbon in the nose tunnel flutters; it is removed, along with the safety pins. So are the red ribbons in the nacelle wells, ending their mad dancing in the prop wash.

Manley now has the green earphones on. The props rev into a thunderous crescendo, slow down gradually. He gets the dispatcher's go-ahead, yells something and waves. We wave back. The ship moves, props biting deeper into the salt-laden air.

Crew chiefs leads the way, backing rapidly, dodging other ships—until the runway lies clear ahead for the pilot to see. The ship gathers way and lurches toward the leeward end of concrete. There it halts, motors warming for the dispatcher's (*Continued on page 142*)



De Havilland "Mosquito" two-seat reconnaissance bombers in formation. Photograph "The Aeroplane" Copyright.

The de Havilland "Mosquito" Bomber

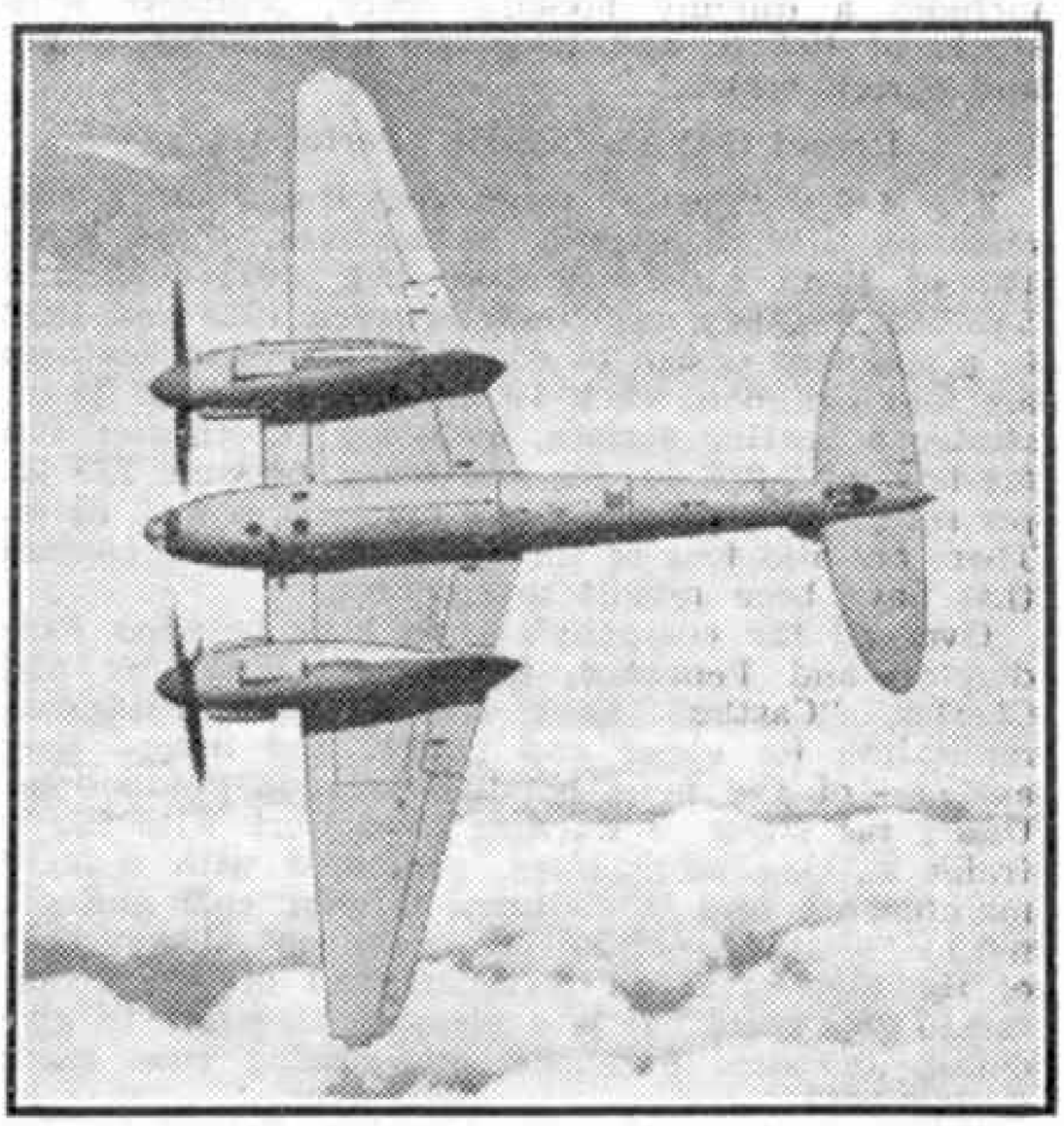
THE de Havilland "*Mosquito*" is one of the most interesting recent additions to the fleet of Bomber Command. This twin-engined craft received its first official mention on the occasion of the daylight raid on the Nazi party headquarters in Oslo on 26th October 1942, when the Quislings got such a nasty shake-up. Since then "Mosquitoes" have carried out a remarkable series of daylight raids and quite clearly have become a new worry to the Luftwaffe.

The "Mosquito" has many interesting features. In the first place it is of wood construction. This might suggest weakness, but actually its airframe has stood up to service as well as any metal structure would have done. The wood has resisted cannon and machine gun fire as effectively as metal. Then it has exceptional speed and a very fast rate of climb, qualities that have enabled it to deal effectively with the Focke-Wulf Fw 190 and the Messerschmitt Me 110. This has been definitely shown by the small number of "Mosquitoes" that have failed to return from their various operations. The crew consists of two, the pilot on the left of the cockpit and the observer on the right. Reports from crews indicate that the aircraft is comfortable and good to handle.

Its good performance at low levels makes the "Mosquito" very suitable for bombing attacks, and the squadrons have been specially trained for this kind of work. The bombs have delayed-action fuses to allow the machines to get away to a considerable distance before the explosion takes place.

The "Mosquito" looks very attractive in flight, and its graceful lines are well shown in our cover picture, reproduced from a fine Kodachrome colour photograph taken by Mr. J. Yoxall, chief photographer of "*Flight*," and kindly lent us by the de Havilland Aircraft Co. Ltd.

The two raids by "Mosquitoes" on Berlin on 30th January brought great joy to this country. Nothing could have been more fitting than that Goering, head of the Luftwaffe, should have to scuttle away to shelter from our bombs as he was about to begin his broadcast.



An unusual picture of a D.H. "Mosquito," showing the fine streamlining.

Railway News

L.N.E.R. Staff Training School

On 22nd February at Watton House, the home of the late Sir Nigel Gresley, famous designer of locomotives, Mr. C. H. Newton, Chief General Manager of the L.N.E.R., opened the first completely self-contained school for station clerical staff to be established in this country. Mr. Newton, who was at one time Chief Accountant of the L.N.E.R., has already established similar schools at Scarborough and Whitley Bay. At these two schools, however, buffet cars at stations are used as classrooms and boarding houses as living quarters, and yet another school of this kind was opened at Harrogate on 1st March. The school at Watton House therefore differs in that it is under one roof, and the L.N.E.R., through their Hotels Department, are carrying out all the domestic and catering arrangements.

Twenty pupils at a time will be enrolled for a course lasting four weeks, with intervals at each weekend. Pupils are being selected mainly from newly-joined members of the clerical staff, after they have spent one or two months in the service, and it is expected that in a four weeks' intensive course in passenger and goods station accounts work, they will reach a standard of proficiency that they would otherwise attain only after a year's station experience.

The first twenty pupils will be girls, for the majority of the clerical staff at many stations are now female; but some of the subsequent courses will be for boys.

Watton House is a pleasant country residence situated in its own grounds, with a trout stream running through the ample gardens. Lectures will be given in a room which the late Sir Nigel Gresley, as Chief Mechanical Engineer of the L.N.E.R. constructed early in the war to accommodate certain of his Headquarters staff, and its equipment includes a dummy booking office, complete with stocks of tickets, and telegraph instruments, ledger and parcels scales.

Re-built S.R. locomotives. On the right is N15X 4-6-0 No. 2332, originally a L.B.S.C. engine, and on the left No. 722, a T9 4-4-0.

Recent G.W.R. "Castle" Performances

The 4–6–0 "Castle" series constitutes the largest class of G.W.R. express locomotives, there being 127 of them numbered 100, 111, 4073–4099 and 5000–5097. They were built between 1923 and 1938 to a standard design of which the principal features are four cylinders, each 16 in. diameter with 26 in. stroke; a heating surface, including superheater and fire-box, of 2,312 sq. ft.; and boiler pressure 225 lb. per sq. in. The driving wheel diameter is 6 ft. 8½ in. There are also four of the older "Star" class engines that have been rebuilt to conform.

Over all the company's main lines between Paddington and Penzance, Gloucester, Worcester and Chester, "Castles' have created an outstanding reputation for speed and power, and indeed they are one of the most popular Swindon productions. Under the stress of wartime hard work with heavy trains making more stops, combined with reduced maintenance and sometimes, inferior coal and oil, recent "Castle" performances have not always been of the high standard travellers had become accustomed to expect. It is a pleasure therefore to give details of some excellent time-gaining runs made during 1942.

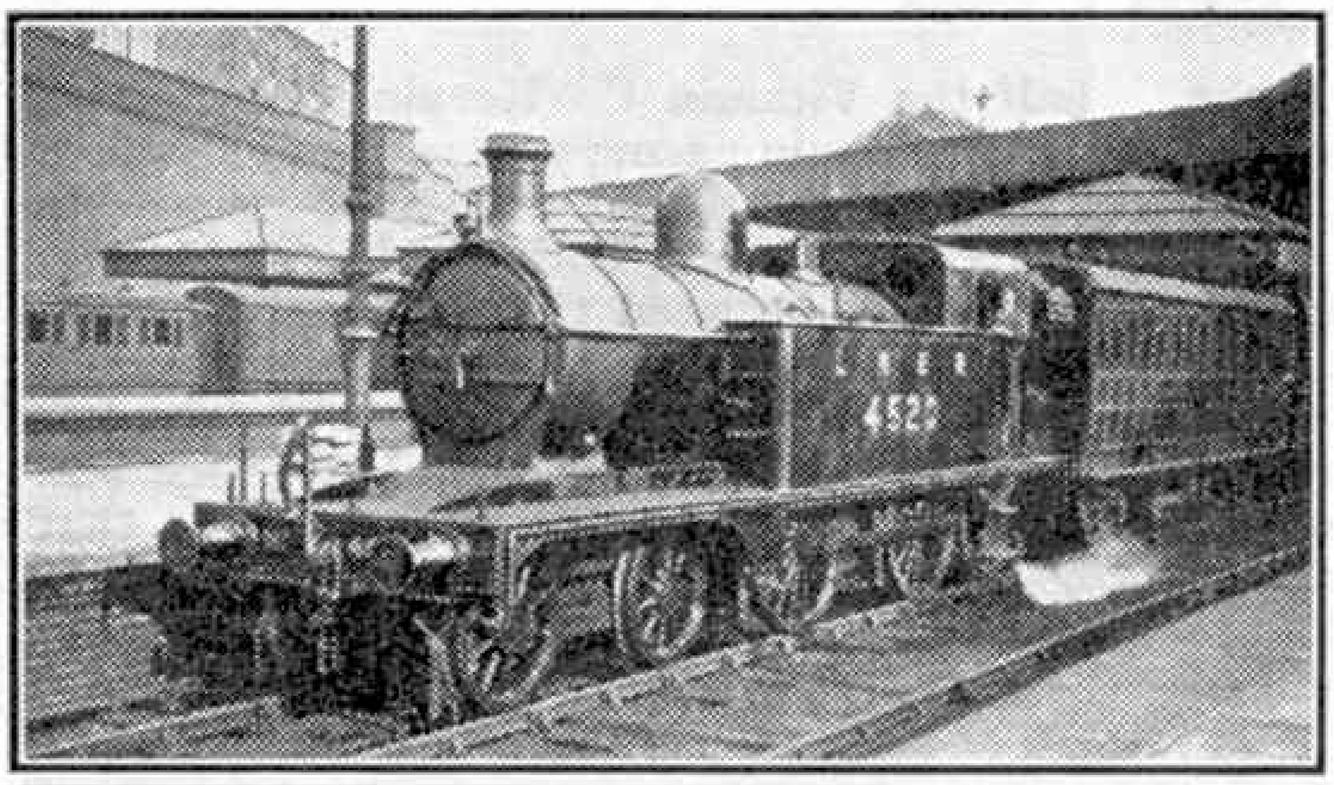
When working the up morning Bristol–London express with a 14-coach train weighing 475 tons full, No. 5066 "*Wardour Castle*" provided some bright wartime travelling on the level after restarting from Didcot. Reading, 17 miles, was passed in 21 min., and then 65–66 m.p.h. was sustained past Maidenhead and Slough, so that 5 min. of a late start had been regained when Southall was passed, 44 miles in 47 min. But for signal checks outside, Paddington would have been reached in 58½ min. for 53 miles, and as it was the total time from Didcot was only 60½ min. The working allowance is 65 min.

With a lighter 330-ton train on the Worcester–Oxford route, where stops are nearer together, No. 5088 "*Llanthony Abbey*" of the same class, again on the morning express to London, gave a most spirited run in thick fog, which was a striking testimony to the efficiency of the G.W.R. train control system by means of which the driver receives audible indication of the aspect of each distant signal. From a restart at Moreton-in-the-Marsh, Adlestrop, nearly 4½ miles, was passed in 6 min., and 67 m.p.h. was averaged over the next 20 miles of level or slightly falling gradient, with a maximum of 75, even time being attained in 23 miles. Despite adverse signals approaching Oxford that city was reached in less than the fairly tight allowance of 33 min. for 28½ miles.

Some recent runs by London–South Wales expresses have not always been distinguished by punctuality, but a "Castle" hauling the 8.55 a.m. express from Paddington with a load of over 400 tons, after keeping exact time to Reading stop, 36 miles in 44 min., made the 97½ mile non-stop run thence to Newport in 2 min. under booked time by dint of steady running although checked at Winterbourne, Patchway and Severn Tunnel Junction. Thus the net time from Reading was not more than 114 min., giving an overall average of 51½ m.p.h. Owing to abnormal loads for the steep ascent out of the Severn Tunnel, these trains now frequently halt at Pilning or Badminton and Severn Tunnel Junction in both directions in order to attach or detach an assisting engine.

On the 4.5 p.m. Paddington-Birmingham No. 5070 "*Sir Daniel Gooch*" hauling 360 tons took things easily uphill, but ran to the first stop at Bicester in 3½ min. under booked time. The maximum touched near Haddenham was 76 m.p.h. The more tightly timed start-to-stop stages, Bicester-Banbury and Banbury-Leamington, were covered approximately as scheduled, with some fast travelling approaching Leamington so that half a minute was regained during a 20-mile run.

It is reported that No. 5025 "*Chirk Castle*" brought the mid-day Bristol express into Paddington 15 min. early recently, although 4 min. late leaving Bath, thanks to smart station working and running. The train was punctual on leaving Swindon, whence 77¼ miles were covered in no more than 80 min. compared with the 95 now liberally allowed. It was a heavy train of 15 packed corridors, weighing almost or quite 500 tons gross.



Ex-G.N. 4-4-2 passenger tank locmotive No. 4520. Engines of this class now work in many provincial areas.

Southern Railway Building Standard 2-8-0s.

A ceremony at a Southern works recently marked the construction of the first two War Department 2–8–0s of the Stanier type, which carry L.M.S. lettering and numbers 8600–1. These had been completed within two months as part of a scheme for spreading over the building of more locomotives necessary for the war effort.

L.M.S. Locomotive News

Class "8" standard Stanier 2–8–0 freight engines have appeared in the Highlands at Inverness, Oban and elsewhere. As they are now permitted to work on all the main Scottish routes, their considerable tractive power should be valuable for handling heavy goods trains over the steep gradients of the north. Assisting engine mileage also will be reduced.

Nos. 8156 and 8160, other new examples of this class, were recently noted, also 2 cyl. 2–6–4T No. 2668 of the "2663" series now in hand. Somerset and Dorset section 2–8–0s work over the Midland Division sometimes as far as Gloucester or Birmingham. A regular working southward from London by class "4F" 0–6–0s is with goods trains from Willesden through Clapham Junction to Three Bridges, on the S.R. Brighton main line, and back.

New G.W. Engines

The latest "Hall" class 4–6–0 mixed traffic locomotives seen are numbered 6946–50. Further 2–8–0 goods engines are Nos. 3865–6, and the 0–6–0T series has been continued by the construction of Nos. 4630–7.

Southern Tidings

It is reported that a successful test run was made from Waterloo to Exeter and back on the 12.50 p.m. ordinary expresses in each direction, making the customary stops, with 20 bogies, eight empty, representing some 650 tons total weight of train. The engine was 4–6–2 21C 10 "*Blue Star*" throughout. This was a formidable task indeed over the steep gradients west of Salisbury, particularly on the return journey, when stops were more frequent and some time appears to have been lost.

Eastern section "D1" rebuilt 4–4–0s and Brighton, Central Section, "K" 2–6–0s have been observed working on the Portsmouth and Bournemouth routes via Eastleigh. Heavy cross-country ordinary or special trains are still seen in this area hauled by two Drummond 4–4–0s, as in the old days.

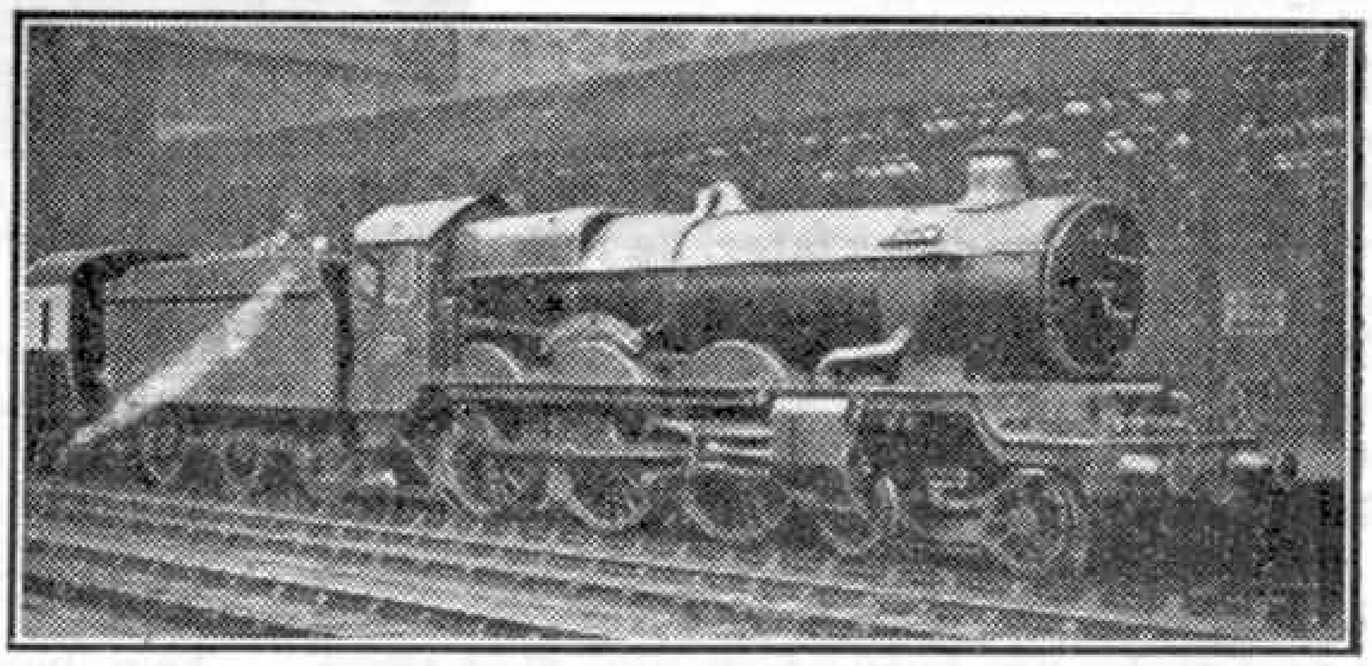
The whole of the first order for 40 of the new "Q1" 0–6–0 engines seems to have been completed, Nos. 37–40 having been reported at work, as have Nos. 15–17 of the first batch built at another works. These "austerity" locomotives have lately been seen on Reading-Redhill passenger trains on a route that has very largely been a 2–6–0 preserve during the last few years. "H2" class Brighton "Atlantics" are working Eastern Section mainline trains from Ashford shed.

A School for Signalwomen

Some classes of employment in which women are now engaged on the British railways call for little in the way of technical training, but women are now being called upon to undertake more skilled and more strenuous duties. For instance, signalwomen, who are to be given a more extended trial on the L.N.E.R., need many weeks of careful training, and for this purpose the company have opened a signalwomen's school at Leeds under the direction of the District Inspector with an experienced signalman as instructor. The course is both theoretical and practical. One day a week the women go to signal-boxes to observe the actual working, noting the many things that have to be done with speed and accuracy, before taking their intermediate and final examinations leading to a "pass out."

A Locomotive Enthusiast's Mecca

At Chester from time to time at least 13 different types of G.W. engines may be seen, including "Castles," "Stars," and "Halls" 4–6–0; 47xx 5 ft. 8 in. 2–8–0s; "Dukes" 4–4–0; 2–8–0, 2–6–2, 2–4–0 and 0–4–2 tanks. In addition 20 different L.M.S. classes appear, ranging from "Pacifics" to Webb 2–4–2 passenger tanks, and including former London and North Western and Midland 4–4–0s, Midland type 0–6–0 goods and Crewe 0–8–0 mineral locomotives of both L.N.W. and L.M.S. origin.



"Castle" class No. 5052 "Earl of Radnor" about to start a G.W. express to South Wales.

A similarly large variety is to be seen in the neighbourhood of Chester and Northwich on the L.N.E.R. (Cheshire Lines Joint) system. These include "Sandringhams", "K3" 2–6–0s, Great Northern 4–4–2Ts and Great Eastern 0–6–0Ts, in addition to nearly all the Great Central 4–6–0, 4–4–2 and 0–6–0 classes, with some of the still older 4–4–0 and 0–6–2T types that originally belonged to the Manchester, Sheffield and Lincolnshire Railway, the predecessor of the former Great Central Railway.

Waterless Vegetables

Uncle Sam's Lightweight Foods for his Troops

By Andrew R. Boone

EVEN in these days of high-speed tanks and jeeps, an army still travels on its stomach, and Uncle Sam intends that American doughboys and sailors shall enjoy body-building and health-giving vitamin-laden vegetables along with their meat and dessert, at all distant outposts.

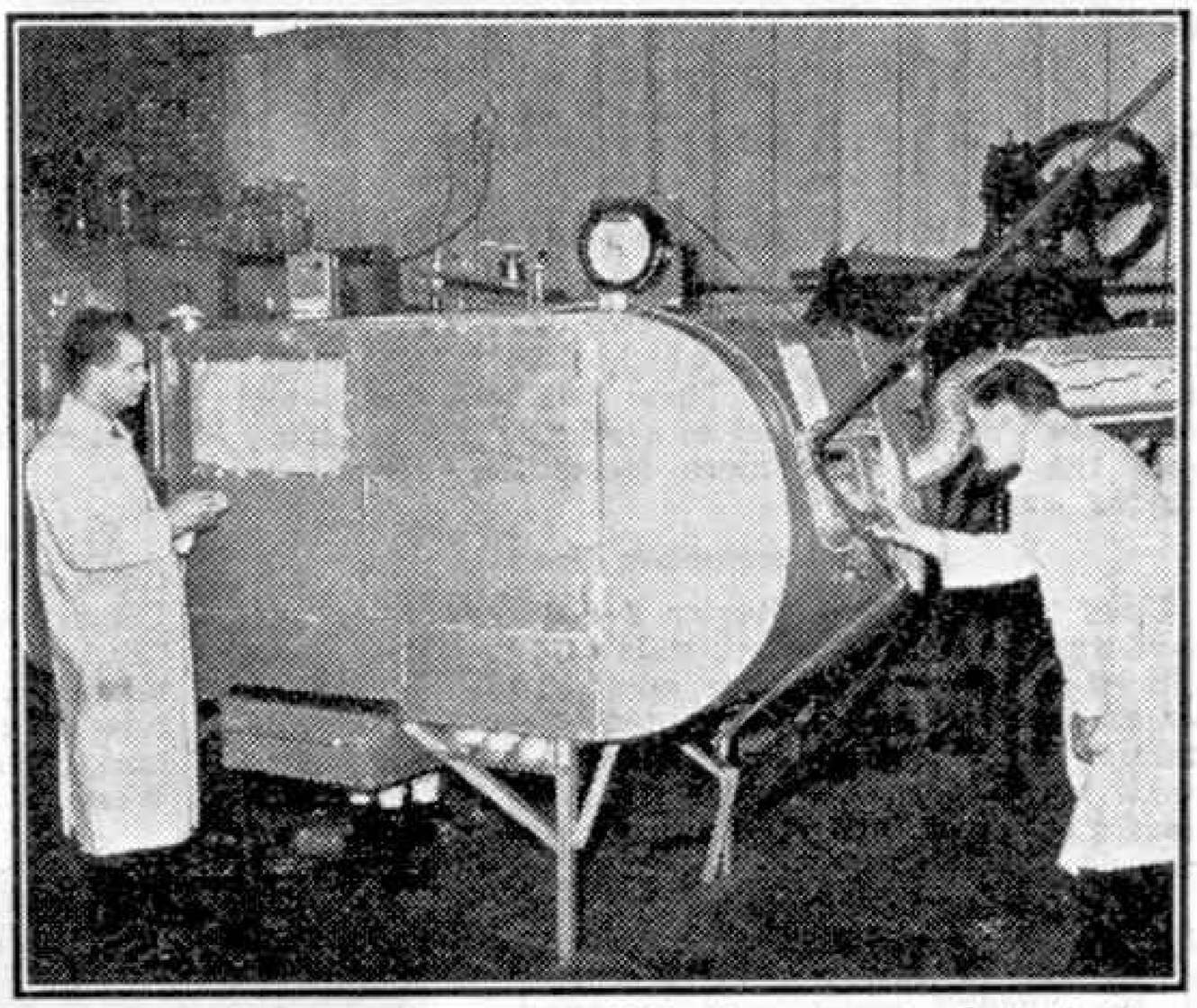
The wise old uncle knows that all vegetables contain large amounts of water. Water is heavy and bulky, and when a food ship pulls into the Red Sea or the Dutch East Indies, bearing fresh or canned vegetables, nine-tenths of the load is water, which is costly both in ship space and time to transport, and utterly without value as a food. The town pump can replace the water in a few hours.

To avoid this wasteful practice, the Army plans to feed doughboys in Alaska, Eritrea, West Africa . . . on a score of fighting fronts . . . millions of pounds of dehydrated vegetables during the coming months. When a company cook, fretting about the dinner menu, starts to prepare the evening meal, he will rip open two or three five-gallon tin cans, scoop out a few pounds of peas hard as baked clay, and sweet corn more wrinkled than a sun-dried prune, and a half-dozen compressed cabbage discs. He will toss the peas, corn and cabbage into a kettle of cold water; thirty minutes later, he will start these vegetables simmering. Another half-hour, and the vegetables will be ready—sweet, tasty and nearly as fresh to the taste as the day they were harvested back in California.

Researchers in a laboratory maintained by the U.S. Department of Agriculture at Los Angeles are seeing to it now that these foods will reach the fighting fronts bearing virtually all the food values of fresh vegetables. There Dr. E. A. Beavens, and others, working under direction of Dr. E. M. Chace, chairman of the department's dehydration committee, have discovered means not only of preserving the vegetables for long periods in all kinds of climate, but also of retaining virtually all the Vitamins A and B, and more than half the Vitamin C. Keeping Vitamin C, number one scurvy preventor, which dissolves in water and just seems to evaporate from both leafy and solid vegetables between the field and home, is an achievement of the first magnitude.

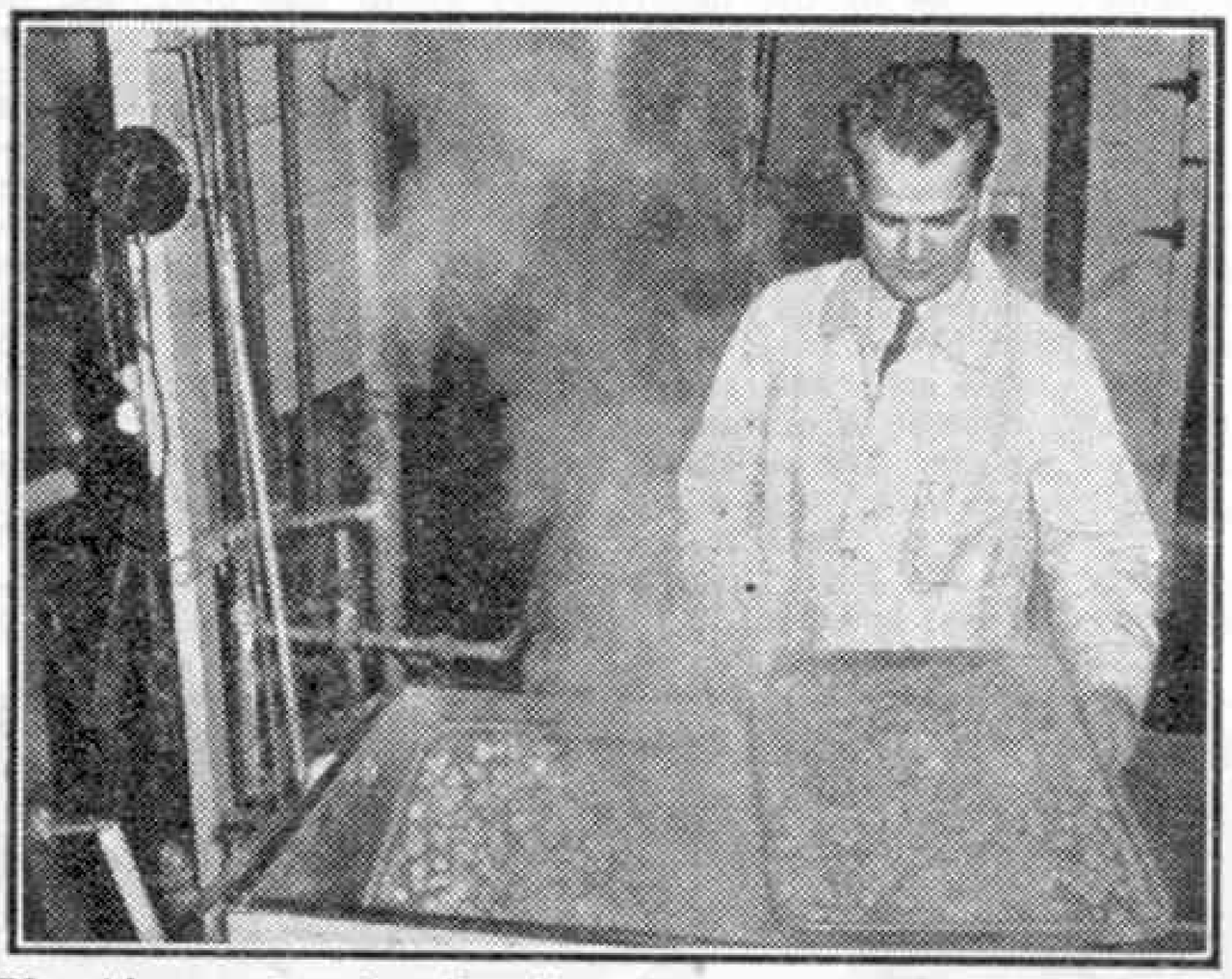
When I visited this "house of dehydration" recently, I saw how Dr. Chace and his associates have solved a problem that has perplexed scientists for many years. The key to their taste-and-colour-texture-vitamin-preserving method is a combination of steam bath and dehydration, the latter being accomplished in a small plant containing features so new that they have not yet been patented. Here I saw garden fresh cabbage and carrots become brittle shells of their former selves in two hours. Two large heads of cabbage, enough to feed 20 hungry men, were compressed, after dehydration, into a disc small enough to fit in my hand. Yet in those few ounces I still had enough cabbage to feed those same ravenous appetites.

Suppose we follow the trail of a crate of carrots through the new process. We will start with six crates, each weighing 33 pounds. They were pulled an hour ago, and now they are being topped.



In this trailer-like dehydrator, U.S. Department of Agriculture chemists select vegetables which may be dried for military and naval use.

trimmed, washed and scraped. Clean and crisp, just as you would serve them for dinner, they are cut into discs about a quarter-inch thick. After being spread



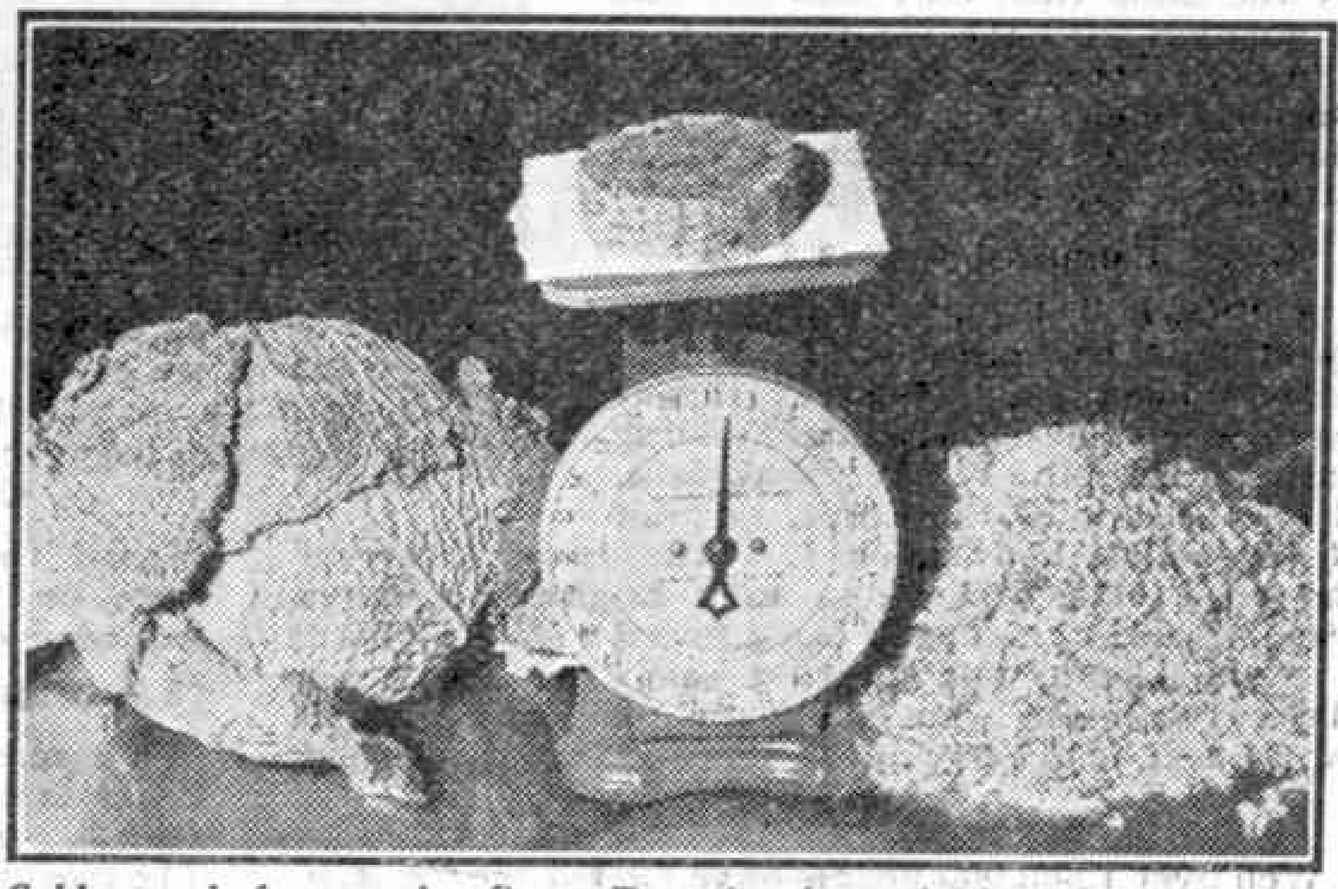
Blanching or steaming for nine minutes at 212 degrees precedes dehydration of carrots. Other vegetables are blanched from two to 10 minutes.

evenly on wire trays, they are placed in a square receptacle resembling a laundry tub, and covered. For six minutes steam rises from jets below, scalding each bit thoroughly. This process is called blanching, and it performs the important task of inactivating the enzymes, organic catalysts that cause chemical transformations in plants, thereby halting processes which ordinarily would destroy the colour, flavour, and vitamins.

From the steam bath the carrots are carried to the dehydrator, near by. This device, built undersize for experimental purposes, resembles an all-metal motor car trailer standing on rigid legs, and is about the size of a medium trailer. It is not intended to dry large quantities of vegetables, but, as Dr. Beavens explained, makes possible the selection of the varieties that will yield the best dried products. Within, after the doors are closed, air flows along baffles of a newly developed pattern, passing in parallel lanes over the material. Flowing at high velocity, from 900 to 1,100 linear feet a minute, with the temperature carefully regulated in the 150–180 degree range, the dehydrator will turn out the dried food in periods ranging from an hour for spinach and other greens, to four hours for corn.

But back to the carrots. The contents of six crates require several runs. So we wait, and at last we have a small pile of crinkly discs. We weigh them—17 pounds. They fill two five-gallon cans. If they were intended for Army use somewhere across the world, the shipper would drop a small chunk of dry ice into each can before filling it, and he would seal the lid tightly with shellac. The dry ice, releasing carbon dioxide, would halt any oxidisation, preserving them for a year or longer. And the two cans would occupy about one-ninth the space now required for six cases of fresh or frozen carrots on that heavily laden transport.

Our fighting men are due for more surprises, now hatching in this laboratory. While the war department is mainly interested in carrots, onions, cabbage and white potatoes, Dr. Beavens is hard at work on sweet potatoes, string beans, lime beans, peas, chard, mustard and other greens. He faces three "musts" before the Army will accept his results. The vegetables must keep well in all climates for at least a year; they must rehydrate within an hour; and he must drive 92 per cent. of the moisture from potatoes and from 95 to 97 per cent. from all other vegetables.



Cabbage—before and after. Two heads weighing four pounds shrink to six ounces. Compressed disc of dehydrated cabbage on scale is equal in fuel value to original heads. Disc is compressed from dehydrated leaves at right.

It is estimated that 25,000,000 dehydrated pounds of all vegetables were produced during 1942—enough to provide 300 servings for 1,000,000 soldiers. And all the food essentials are there, just as in canned and fresh vegetables.

Air News

Lockheed Vega "Ventura" Bomber

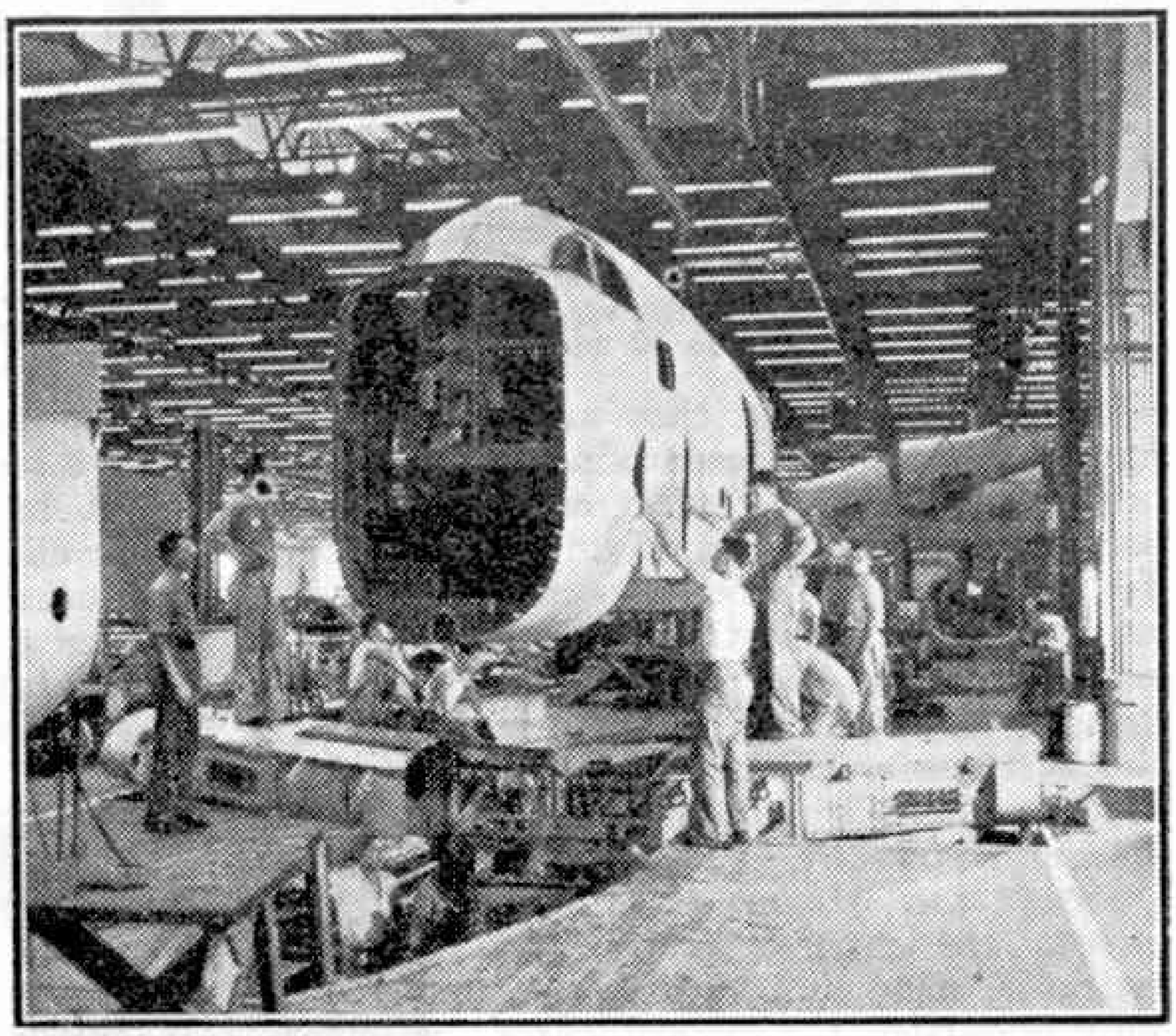
The photograph on this page shows a Lockheed Vega "Ventura" bomber under construction at the Burbank, U.S.A., plant of the Vega Aircraft Corporation, a subsidiary of the Lockheed Aircraft Corporation. "Venturas" have been flown across the Atlantic in considerable number, and are in service with the Royal Air Force, U.S. Army Air Forces, and U.S. Navy. The first official mention of them operating with Bomber Command, R.A.F., was made in December last year, after they had taken part with "Mosquitoes" and "Bostons" in the great daylight raid by nearly 100 aircraft on the Phillips radio factory at Eindhoven, in Holland. They have since carried out other very successful raids on objectives in enemy-occupied countries.

The "Ventura" is a military version of the Lockheed "Lodestar" high-speed transport. It carries a crew of four, and is armed with two machine guns in a Boulton Paul power-operated gun turret midway along the fuselage, two more in an under-gun position behind the bomb bay, and others in the fuselage nose for ground strafing and attack purposes. Its two 2,000 h.p. Pratt and Whitney "Double Wasp" engines give it a top speed of about 300 m.p.h. The range, which varies according to the bomb load carried, is secret.

The Vega concern was formed in 1937 to carry out experimental and development work on light aircraft, and became wholly-owned by the Lockheed firm in 1941. In tackling the production of the "Ventura" bomber the Vega Aircraft Corporation had to overcome problems of tooling, training, and material supply, and they accomplished this so well that they completed their first contract for these machines ahead of schedule. At the same time they also got into production with the big Boeing B-17 "Fortress" bomber, under the Vega-Boeing-Douglas pool plan, and finished their first B-17 six months ahead of U.S. Army expectations.

Every Aircraft on the Job

One of the uncertainties of air line operation in wartime is the liability of the machines to be requisitioned by the military authorities, in an emergency. Mr. A. B. Corbett, Director-General of Civil Aviation in Australia, recently gave an instance of this. One night in December last every civil aircraft in that country was called up and ordered to fly to Papua to transport equipment and personnel to the Buna battle area. Some of the air liners were in flight on their scheduled routes when they received the call, and after landing their passengers at the nearest aerodrome they flew at once to the appointed place. The machines assembled at Port Moresby the next day, and a few hours later they were on their way to the Buna front, supplementing a large fleet of Air Force transports in carrying men, munitions, guns, and food to improvised aerodromes a few miles behind the front line. The air liners made many trips on this emergency duty, and brought back wounded on the return flights.



Assembly department workmen guiding a Lockheed Vega "Ventura" fuselage into place in the mating jig where the wing centre section, already in place, is attached. This photograph and the upper one on the opposite page are by courtesy of the Lockheed Aircraft Corporation, U.S.A.

Glider Launched from a Lake

A "Falcon" I glider towed by a speed boat has been launched from Lake Windermere. The experiment was carried out by the Air Training Corps, with Mr. W. W. Wakefield, M.P., Director of the Corps, as pilot of the glider, and Major J. Pattinson in charge of the boat. The glider rose to a height of between 150 and 200 ft., and after being towed a short distance it was released, and alighted safely on the water. Major Pattinson, who had made the glider suitable for the test, is to carry out further similar experiments.

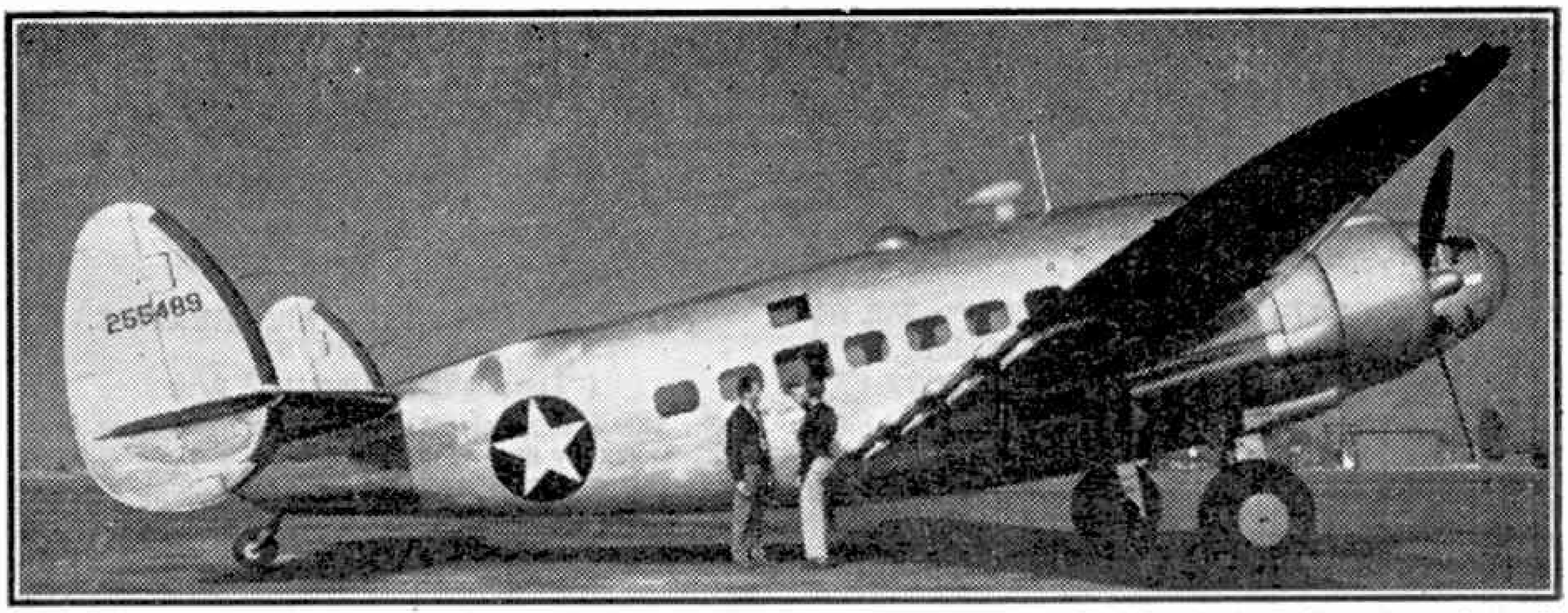
Success of R.A.F. Exhibition

Well over 1,500,000 people have visited the "*R.A.F. in Action*" Exhibition which has toured Britain and Northern Ireland. Leeds topped the list, with 183,413 visitors, London was second with 136,000, and Glasgow third, 95,000. The Ministries of Air and Information organised the show, and provided 300 greatly enlarged photographs. The tours have raised nearly £3,000 for the R.A.F. Benevolent Fund.

The "working model" exhibits delighted the crowds, and were seldom idle. Electrical bomb release gear brought home the thrills of the bomb-aimer, and amateur spotters tried their luck at the aircraft identification chart.

"Liberator" Bomber Flies 2,000 Miles Without Crew

A remarkable 2,000-mile flight by a Consolidated "Liberator" bomber from which the crew of six and the two passengers had baled out was reported recently. The machine took off from Florida for a flight to South America, but when about eight miles out to sea it developed tail flutter and began to lose height. Cargo was thrown overboard in an effort to keep the machine in the air while the pilot endeavoured to get it back to land, but it lost height too rapidly and the occupants baled out in coastal waters; six of them were rescued. Before baling out, the pilot set the automatic pilot to take the machine on level flight across the Atlantic, but somehow it changed course, and after flying for 12 hrs. across the ocean and the Gulf of Mexico, covering a distance of 2,000 miles, it crashed into a mountain in Mexico.



The well-known Lockheed "Hudson" is here seen in its latest form, as the AT-18 trainer. This new version will be used only in the United States.

A New Double Purpose Trainer

A new version of the well-known "Hudson" reconnaissance bomber so extensively used by Coastal Command, R.A.F., has been produced. It is called the AT-18, and is being made in two forms, one for the training of advanced students in aerial gunnery, and the other for training students in a course of aerial navigation.

The Lockheed AT-18 is based on the "Hudson" III. Most of the interior "Hudson" equipment is omitted, and in the case of the gunnery trainer the cabin is little more than a shell within which are seats, inter-'phone equipment, and regulation U.S. Army Air Forces radio for a crew of two and one student. A low-pressure oxygen system is provided, and there is a target windlass installation that lets out the target sock through the tunnel gun opening. Instead of the Boulton Paul gun turret as used by the R.A.F. in the "Hudson," the AT-18 has a Martin turret, in which the student practises firing two 50 calibre machine guns at a wind sock trailed behind another AT-18.

The AT-18 for navigational training has neither gun turret nor armament. Stations are provided for a crew of two and three students, and the instructor is usually a member of the crew. The standard "Hudson" instruments are duplicated on a panel in the cabin and in plain view from the students' desks. Above each desk there is an astrograph, or map of the stars, and in the cabin roof there is a navigation dome in which the students are taught how to take bearings with a sextant.

Neither version of the Lockheed AT-18 trainer is camouflaged, as no training duty outside the United States is anticipated.

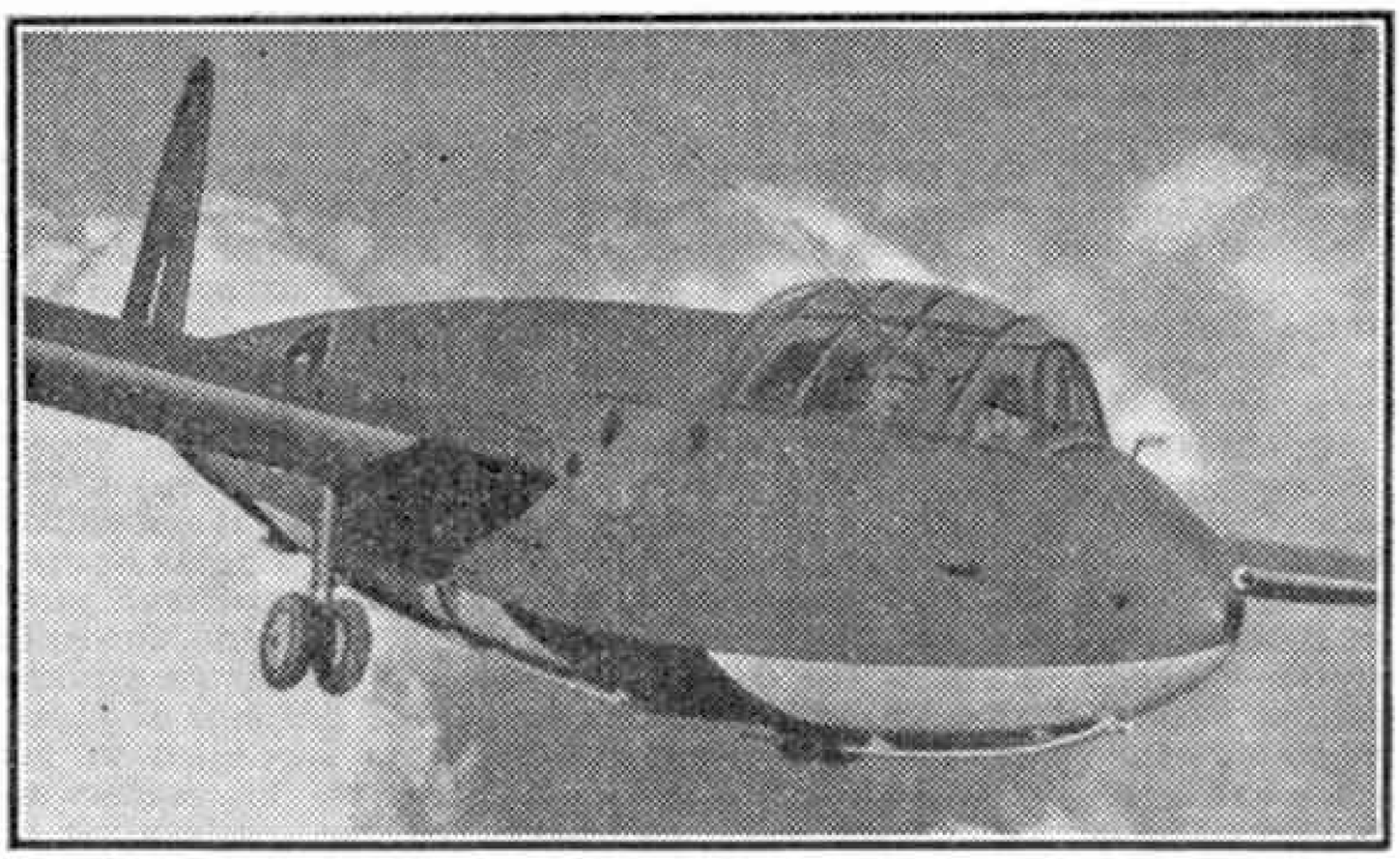
New Types of Enemy Aircraft

General details are available of several new types of enemy aircraft now in service. One is the Messerschmitt Me 323, a 6-engined transport monoplane described as a "powered glider," and capable of carrying about 130 troops. It has a wing span of 178 ft., and the 700/800 h.p. Gnome-Rhône engines are mounted in the wing leading edge. It has 10 landing wheels.

Another new six-engined aircraft is the Blohm and Voss Bv 222 flying boat, one of which was shot down early in the fighting in Tunisia. It has a wing span of 150 ft. and six 1,000 h.p. BMW engines. The stabilising floats under the wings are partly retractable.

Yet another version of the Messerschmitt Me 109 fighter has appeared. It is called the Me 109G2 and has a 1,500 h.p. Daimler-Benz liquid-cooled engine. This latest version is similar to the Me 109F and like that earlier type is armed with a 20 mm. Mauser cannon firing through the airscrew hub, and two 7.9 mm. machine guns mounted on the engine cowling. In addition, however, it has provision for a 20 mm. Mauser cannon under each wing.

A new type of heavy bomber put into service by Italy is the Piaggio P.108, which has four 1,500 h.p. engines and a top speed of 290 m.p.h. It is a development of the Piaggio P.108C commercial transport monoplane, which has seating for 32 passenger by day and accommodation for 16 by night. The original P.108C had a pressure cabin for high-altitude flight, and a range of about 2,500 miles.



An unusual view of a General Aircraft "Hotspur" glider. This illustration is from a photograph taken by Cyril Peckham, General Aircraft Ltd.

Trans-Canada Air Lines Notes

Lockheed transports of Trans-Canada Air Lines have been provided with new navigation tail lights, so that the machines can be recognised better at night. There are two lights, a red and a white, and they blink alternately 40 times a minute.

During last year T.-C. A. aircraft carried 2,260,000 lb. of air mail and 396,000 lb. of air express, increases of 63 and 128 per cent. respectively over the 1941 figures. A total of 106,000 passengers were flown during 1942, which is 24 per cent. more than in the previous year. This heavy air traffic is almost all directly connected with the war.

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With the exception of those issued by the Scientific and Children's Book Clubs, which are available only to members, we can supply copies of these books to readers who cannot obtain them through the usual channels. Order from Book Dept., Meccano Limited, Binns Road, Liverpool 13, adding 6d. for postage.

"AIRCRAFT OF THE FIGHTING POWERS"—Vol. III

Edited by D. A. RUSSELL, M.I.Mech.E.
(The Harborough Publishing Co. Ltd. £1/1/-)

Although only in its third year, this excellent annual publication has already established itself as a valuable book for all who are keen on aircraft, and particularly those who wish to build scale models of military machines in service with the Allied and enemy nations.

The first two volumes had faults inseparable from the production of a new reference work under wartime conditions, but these have been overcome, and the present edition is a first-class job. It is printed on good paper, with the text in easily-readable type, and contains 152 splendid half-tone photographs and nearly 250 outline drawings on a scale of 1 in 72 of 81 Allied and enemy aircraft. It is not in any sense a re-hash of the earlier volumes; almost all the types of machines dealt with are included for the first time, the remainder being revisions recording the latest developments in the types concerned. The specification of each machine is supplemented by interesting notes on its history and development, and in some instances there are brief details of its outstanding achievements in the war. These notes and technical data are specially welcome in regard to the Russian and Japanese machines.

Owing to wartime difficulties, it is impossible to guarantee prompt delivery of books ordered as described at the head of this page, but every effort will be made to ensure speedy despatch.

Almost half of the book is devoted to American military aircraft, and these cover a wide range of Army and Navy types. At one end of the scale there is the Taylorcraft L-57a single-engined, 2-seat Army observation monoplane, which has a loaded weight of only 1,200 lb., and at the other are the 4-engined Boeing "Fortress" II heavy bomber, and the Consolidated PB2Y-3 "Coronado" Navy patrol flying boat which carries a crew of 10, has a loaded weight of 65,000 lb., and a range of 5,200 miles.

Outstanding among the several current British types included is the D.H. "Mosquito" 2-seat reconnaissance-bomber. Here it may be mentioned, as evidence of the efforts made to ensure that this volume should be thoroughly up to date, that when a few hundred copies had already come off the presses, printing was stopped while a revised set of scale drawings of the "Mosquito" was substituted for the one already in the book. Model aircraft constructors will be delighted to have these plans, and those provided of the Avro "Lancaster" bomber and G.A. "Hotspur" glider.

Russian aircraft dealt with include the famous IL-2C "Stormovik" ground-attack bomber, which has proved a terror to German tanks on the vast Russian front. "Tank busting," in fact, the text relates, is a speciality of the Red squadrons.

Turning to the enemy countries, probably the most interesting of the German aircraft of which illustrations and plans are given is the Focke-Wulf Fw 190 single-seat interceptor fighter, Germany's latest answer to the deadly British "Spitfire." The several Italian types dealt with include the Savoia Marchetti S.M.94 (now officially designated the S.M.84) twin-engined torpedo-bomber, which has been used almost to the exclusion of other types for attacks on British convoys in the Mediterranean since 1941. Nine types of Japanese aircraft are illustrated.

L.M.S.R. DIESEL-ELECTRIC SHUNTING LOCOMOTIVES

("The Railway Gazette." 2/-)

On the L.M.S. the Diesel-engined shunting locomotive has by now taken its place as a normal and necessary means towards increased efficiency in railway operation; this book, which is a reprint of a series of articles that appeared in *"The Railway Gazette,"* is a review from the operating point of view of developments on the L.M.S. in the use of this form of motive power. Beginning with the original investigations into the question of providing economical shunting power units, in order to assist in the problem of reducing shunting costs, a summary is given of the initial research work by the L.M.S. and by various locomotive-building firms, and of the steps in the evolution of what may be termed the standard 350 h.p. Diesel-electric 0-6-0 shunting locomotive that is now in use on the L.M.S.

The advantages of the Diesel unit for shunting work are dealt with, as are the special features introduced to facilitate the work of shunters and of the footplate men as a result of the earlier experiments. We are told about the electric speedometer adopted to ensure a constant speed when propelling loads over a shunting "hump," and of the special "step" built in at the forward end of the latest engines for the accommodation of shunters riding from one part of the yard to another. Finally an example shows the advantages realised from the use of a Diesel-electric locomotive in the movement of an exceptional load for which special low limits of speed had to be imposed over certain sections, and the indirect benefits accruing from the employment of Diesel power for shunting duties.

The book is well illustrated. It will appeal to all railway enthusiasts, and the model maker in search of details for a reproduction of one of these unusual prototypes will find it very useful.

"BUILDING AN EMPIRE"

By L. LAMPREY (Harrap. 6/- net)

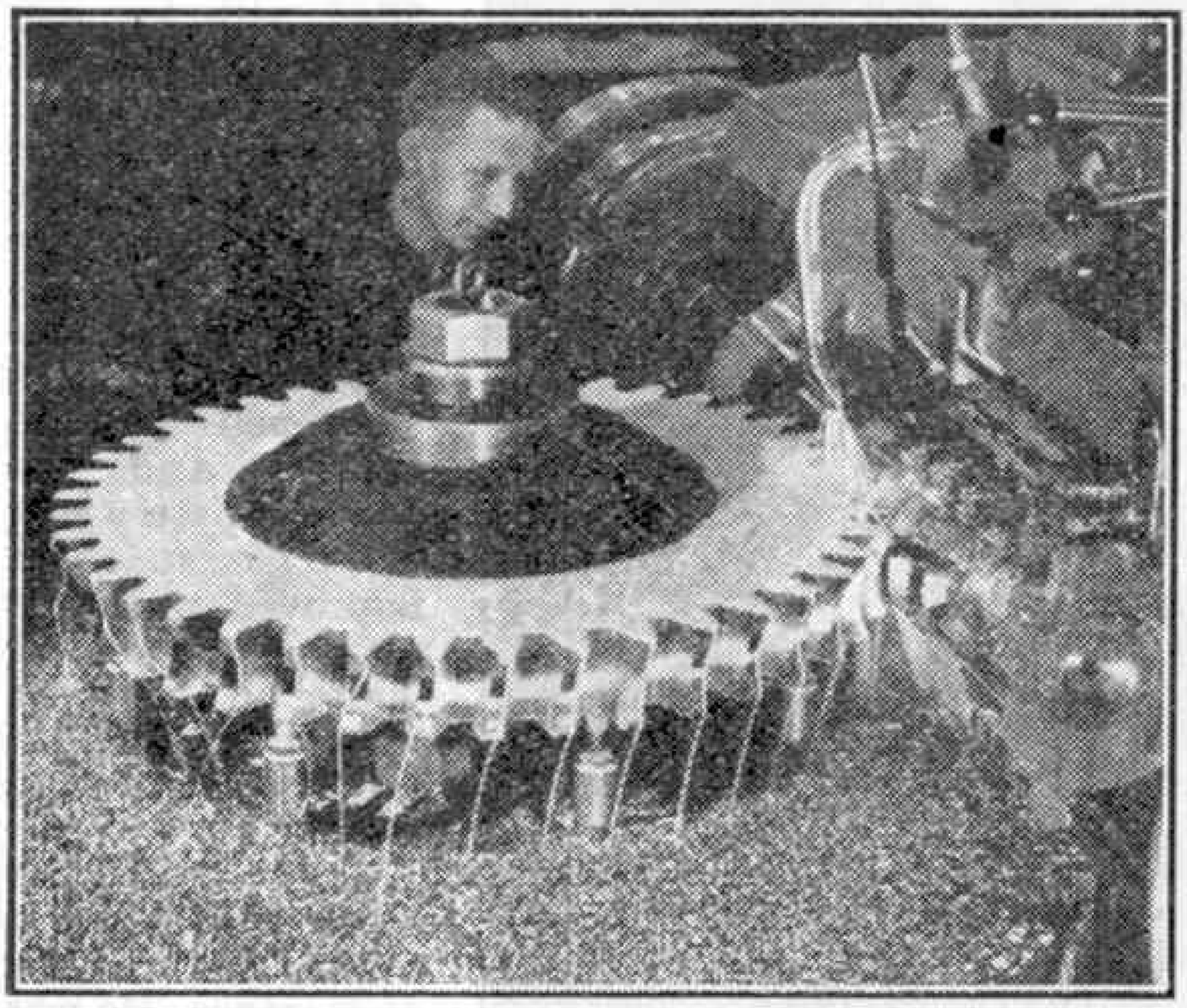
This excellent little book tells the general story of the British Empire. It shows how this developed slowly, with no thought on the part of its founders of the immense size to which it would grow and of the wonderful influence it would exercise on the world as a whole. Exciting stories of explorers and traders, of native tribes and empires, and of soldiers and great colonial rulers are woven into the book, and readers generally will not only have their knowledge of the Empire increased, but will enjoy the telling. The author has tried to bring out unfamiliar aspects of Empire building such as the fights against famine, witchcraft and cannibalism, important parts of our Empire contribution, and dramatic incidents such as the death of Captain Cook and the strange friendship of Will Adams with the Emperor of Japan of over 300 years ago. He has succeeded in his aim and his story should stimulate his readers to search for more information on the combination of independent nations and colonies that make up the Empire. The book is illustrated by nine maps.

Engineering News

GIANT UNITED STATES BATTLESHIPS

One of a group of naval vessels set afloat within a few days of 7th December 1942, the first anniversary of the Japanese attack on Pearl Harbour, was the "*New Jersey*." This is a battleship of the "Iowa" class. Four other vessels of the class, of which the "*Iowa*" was the first, are now under construction, and they will be named "*Missouri*," "*Wisconsin*," "*Illinois*" and "*Kentucky*."

From a recent issue of "*The Shipbuilder*" we learn that the standard displacement of the vessels of this class is 45,000 tons and their full load displacement 52,000 tons, and they are the heaviest fighting naval units in the world. They have an overall length of 880 ft. and a breadth of 108 ft., and their speed is 32 to 38 knots. Their main armament will consist of nine 16 in. guns, and they have twenty 5 in. guns with a host of small anti-aircraft weapons. Each vessel is to carry four aircraft for reconnaissance and fire-directing duties. Catapult equipment is provided for launching the aircraft.



Generating the teeth of a worm gear. The "icing sugar" effect on the rim is due to the way in which the cutting lubricant has spread over the top face. Photograph by courtesy of David Brown and Sons (Huddersfield) Ltd.

Four lines of ways were used when launching the "*New Jersey*." This feature was first adopted in the launch of H.M.S. "*Nelson*" and H.M.S. "*Rodney*," the 35,000-ton British battleships. At the forward end the lines of the new American battleship incorporate a pronounced bulb at the lower levels.

Great activity is being shown in the United States in the construction of aircraft carriers, which seem destined to play a particularly important part in the naval warfare in the Pacific. During the latter half of 1942, three 25,000-ton carriers, named "*Lexington*," "*Essex*" and "*Bunker Hill*," were launched from United States yards, and three other vessels laid down as cruisers were modified for completion as 10,000-ton carriers. It is expected that these six vessels will be completed and in service during the present year, and the programme includes the provision of 10 additional 25,000-ton carriers and about the same number of 10,000-ton vessels of this type.

BEARINGS MADE FROM METAL POWDERS

An interesting recent engineering development is the production of small self-lubricating machine bearings by the moulding of metal powders. Small bearings made of bronze are used in such appliances as electric clocks, refrigerators and vacuum cleaners, and are difficult to lubricate in the ordinary way. In making them, copper and tin powders are pressed in a die, a little graphite or other lubricant sometimes being added to help the metals to flow sufficiently under pressure to penetrate into every corner. The moulded bearings are then passed through furnaces in which the tin melts and alloys itself with the copper.

By this method bearings can be made exactly to shape and size without machining. They are sufficiently porous to take up oil when soaked in it for a few minutes at a temperature a little above the boiling point of water, and the amount taken up is sufficient to last for their normal lives, more oil exuding when the bearings become hot.

A GIANT X-RAY MACHINE

An X-ray unit in which energies of 1,000 million volts will be applied is being constructed in the United States by the General Electric Company of New York, and its object is to produce extremely penetrating rays for use in examining thick armourplate and other industrial materials. The practical limit at present is 8 in. of steel, the penetration of X-rays produced with an energy of one million volts.

The new unit incorporates an electro-magnet, weighing 125 tons, that is built up of more than 100,000 pieces of silicon steel. Laminated construction is necessary because alternating current changing direction 60 times a second is used. In the most intense part of the field of the huge magnet is a vacuum tube 6 ft. long. Electrons shot out from a heated filament in the tube will be speeded up at each change of direction of the current, receiving a 400-volt push each time, and after whirling round on a circuit of many turns they will strike their target and generate a beam of highly-penetrating X-rays. The electrons scattered at the same time are themselves capable of penetrating about 2 in. of steel, and to protect the operators from them and from the X-rays the unit is being installed in a building with concrete walls 3 ft. thick. The control room is outside this structure, and from it operations will be watched in safety through a periscope.

"STAND-SIT" SEATS IN AMERICAN BUSES

Buses and tramcars in the United States are now becoming overcrowded at peak hours, for private motoring there also has been considerably restricted. An ingenious plan for increasing the capacity of these vehicles has been introduced in Washington, where trials are being made of what is known as the "stand-sit" seat. This is higher than the old type of seat. It is of considerably less depth, but the seat and back are shaped to give correct posture in a position that seems to be half standing and half reclining, with the feet on a support placed on the seat in front.

In a typical bus 11 ordinary seats have been replaced by 16 of the new type, which occupy the same amount of room, giving an increase of 10 in seating capacity. In the case of the converted tramcars 68 seats are provided by the new method instead of 48.

Sir Humphry Davy

Scientist and Inventor

ONE of the most romantic figures in the history of science and invention is Humphry Davy, a Cornish boy who was born at Penzance on 17th December 1778. His school career was not long or distinguished, but he was a great reader, and was fond of inventing and telling remarkable stories. As a boy he was forever making fireworks, melting tin, a metal then mined in huge quantities in Cornwall, or carrying out other experiments, many of them dangerous. Fishing was another favourite pursuit, which he kept up throughout life.

Of all Davy's boyhood activities it was his passion for experiments that became uppermost, especially when after leaving school he was apprenticed to a surgeon in Penzance. This turned his mind definitely towards chemistry. The scene of his first efforts was a garret in the house of his guardian, and there experiments that threatened to cause serious damage were frequent, his guardian often exclaiming after some particularly violent effort that they would all be blown into the air! Davy was continually in search of new minerals among the rocks of the surrounding countryside, and during his wanderings he used to sit down when he was tired and indulge in dreams of future scientific renown, dreams that later became realities.

With all his dreaming and story telling, Davy was always practical. There were no laboratories in which he could find apparatus ready made for him, and most of his work was done with kitchen pots and pans, and with anything else on which he could lay hands. As a present from the surgeon of a wrecked French vessel he received a case of instruments that had been salvaged, and seized upon these to make for himself a passable air pump, with which he carried out one of his earliest experiments. He arranged his pump so that he could exhaust the air from a glass vessel in which a small metal cup filled with ice was rotated in contact with a brass plate. The effect of the motion was to melt the ice, and he came to the conclusion that this was due to heat developed by the motion and the accompanying friction. He improved upon his apparatus, and later wrote an essay on his experiment that was published in Bristol.

Humphry Davy, 1778-1829. Portrait reproduced by courtesy of the Director of the Science Museum, South Kensington, London. Crown copyright.

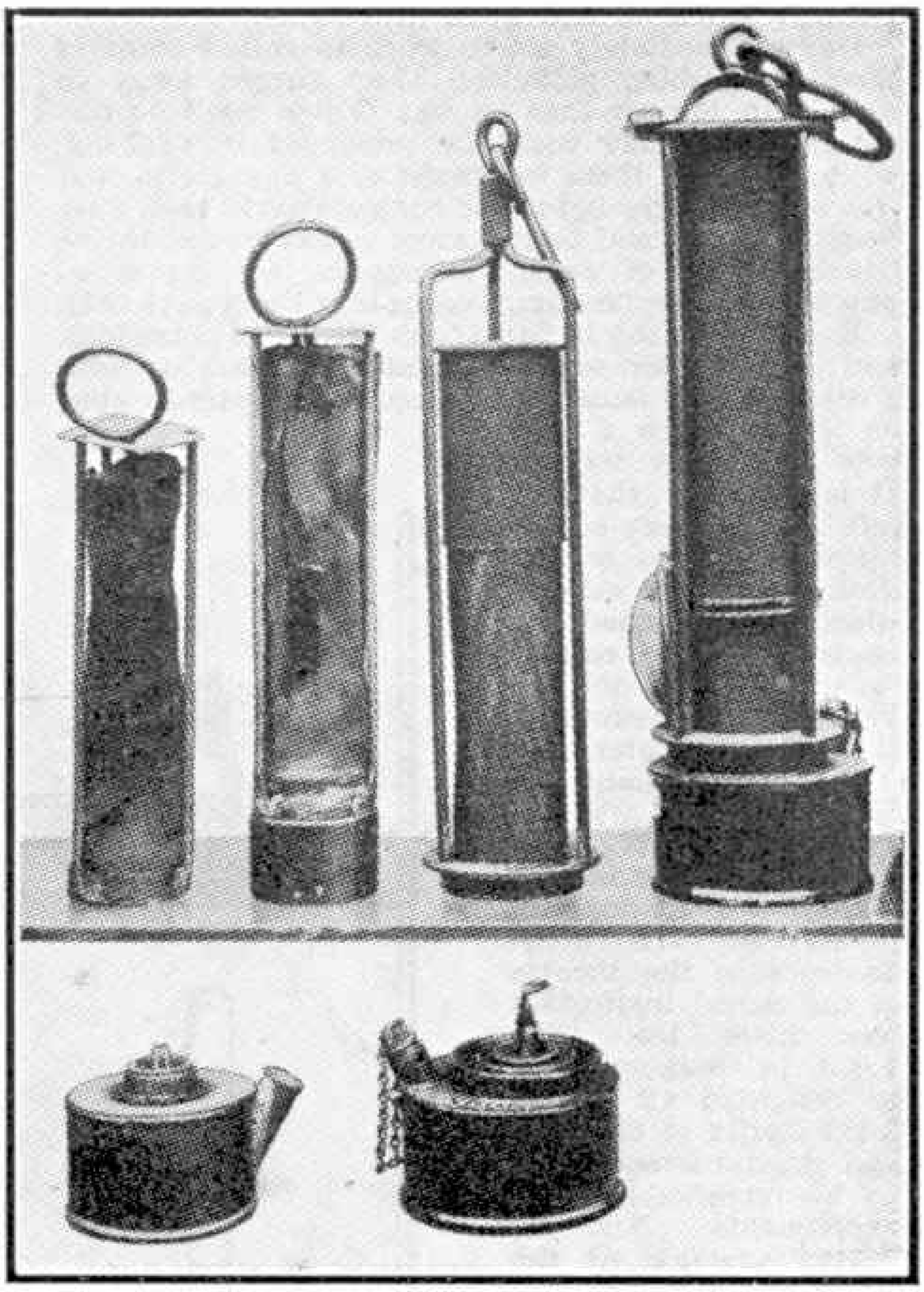
At this time Davy was far from attractive in appearance. He was careless, his voice was rough and his manner insignificant; yet those who knew him and had talked with him about his experiments realised something of his genius. As a result he was recommended to Dr. Beddoes, who was establishing an institution in Bristol for using gases in medical work, and required an assistant. In this institution Davy made various gases and examined them closely, never hesitating to experiment on himself, and at times being in real danger of permanent harm or even of death. One of these gases was nitrous oxide, which he prepared by heating ammonium nitrate. He discovered many of its properties, and inhaled it in pure form, although nothing was then

known of its effects. He discovered that it produced a feeling of exhilaration that usually showed itself in laughter, and the gas actually came to be known as laughing gas. He tried it on many of his friends, some of whom demonstrated their artificially high spirits more forcibly by striking out at their companions, and stamping, roaring and laughing about the room. A more important discovery was that the gas produced insensibility for a time, and this led to its use by dentists for painless extraction.

While Davy was at Bristol a search was being made for a chemist suitable for the post of lecturer at the Royal Institution in London. This Institution had just been founded by Count Rumford, an American, for the purpose of advancing science generally. It was staffed by professors and lecturers who carried on research in its laboratories and also gave regular lectures to popular audiences. Davy had become well known through his remarkable experiments, and was strongly recommended for the post. At first he did not impress Count Rumford favourably, for he was uncouth in appearance and his manner was pert and thought to be over confident; but eventually he was engaged as Assistant Lecturer in Chemistry and Director of the Laboratory, although he was only 22 years of age. The post carried with it a salary of 100 guineas a year, a room in the Institution, and free coals and candles. For his first lecture he was relegated to a small lecture room, but he made such an impression that on the very next day he was promoted to the great Lecture Theatre, and the entire resources of the Institution were placed at his disposal by the gratified Count.

While he was still a small boy Davy had on occasion ranged rows of empty chairs in his room and had solemnly addressed to them long lectures on all kinds of topics. When he really became a lecturer, faced by benches crowded with eager listeners, he made his subjects irresistibly attractive by the brilliance of his language, which delighted poets and other literary men as well as those interested in his scientific work.

Davy had always been attracted to electricity, or galvanism as it was then called. In those days there were no dynamos to generate current. Practically the only source of this was the Voltaic battery, built up of cells containing plates of two metals with dilute acid between



Examples of Davy lamps; the two on the left are the first Davy constructed. From originals in the Science Museum, South Kensington, London. Crown copyright.

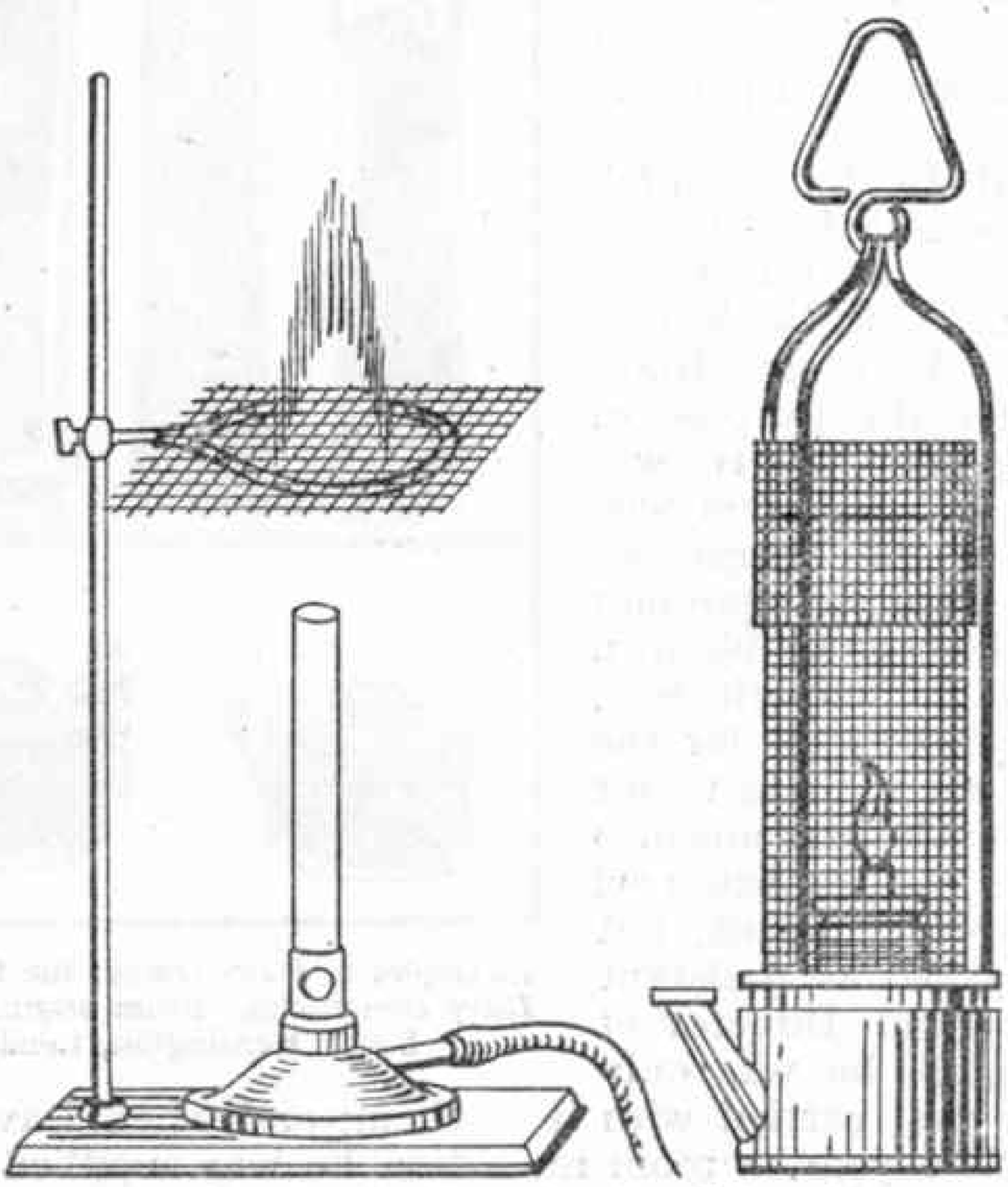
them; and when Davy joined the Institution he was supplied with such a battery of immense size. With current from batteries of this kind water had already been split up into hydrogen and oxygen, and a few other experiments had been carried out, but very little was known of the chemical effects of the electric current until Davy set to work. To begin with, he studied the passage of electricity through chemical solutions, laying the foundation of electro-chemical ideas. Then he tried the effect on potash. He had already passed current through solutions of this alkali, but in effect this simply split the water into hydrogen and oxygen and left the potash unchanged. Now he placed a piece of potash, slightly damped by exposure to the atmosphere, on a disc of platinum connected to one pole of his battery, and brought into contact with it a platinum wire connected to the other pole. The potash immediately began to fuse at both poles; at the upper one, in contact with the positive pole of the battery, there was a violent bubbling, but at the other tiny globules of something that looked like quicksilver or

mercury appeared and burst into flames.

Davy immediately set to work to collect some of these astonishing globules. They burned away so rapidly in the air that he was beaten until he discovered that they could be preserved in naphtha, when he found them to consist of a new metal that was astonishingly light and comparatively soft, only becoming hard and brittle when it was cooled to the freezing point of water. It was in fact the metal now known as potassium, a name that Davy gave to it.

Every schoolboy to-day knows the metal potassium, and probably has seen fragments of it flare up with a rose-coloured flame when dropped in water or even on ice, in which a deep hole is quickly melted. It is to Davy that we owe the discovery of this metal, and also of the similar metal sodium, which he obtained by electrolysis of caustic soda, and is not so violent as potassium in its action on water.

By these brilliant discoveries, and by his amazingly attractive lectures, Davy made for himself a wonderful reputation. His usual audience in the theatre of the Royal Institution was little less than 1,000 in number, and he delighted all by his lucid stories of chemical and general science, and by his remarkably vivid experiments. An excellent example of the latter was a demonstration of volcanic action in which he made splendid use of the new metals that he had discovered. For this a mountain was modelled in clay and a quantity of the metals introduced into its interior. When water was poured down there was a violent action, accompanied by explosions, and streams of red hot "lava" poured out, a result that aroused tumultuous cheering.



On the left a Bunsen flame is seen above wire gauze, through which it will not pass, and the drawing on the right shows how the principle of this experiment is applied in the Davy lamp.

Davy's services to science were recognised by a knighthood conferred upon him in 1812. By that time he had completed 11 years of service in the Royal Institution, and on the day after he became Sir Humphry Davy he gave his farewell lecture there. About that time his eye was injured during experiments carried out with his usual daring and determination on the newly-discovered nitrogen chloride, a violently explosive chemical.

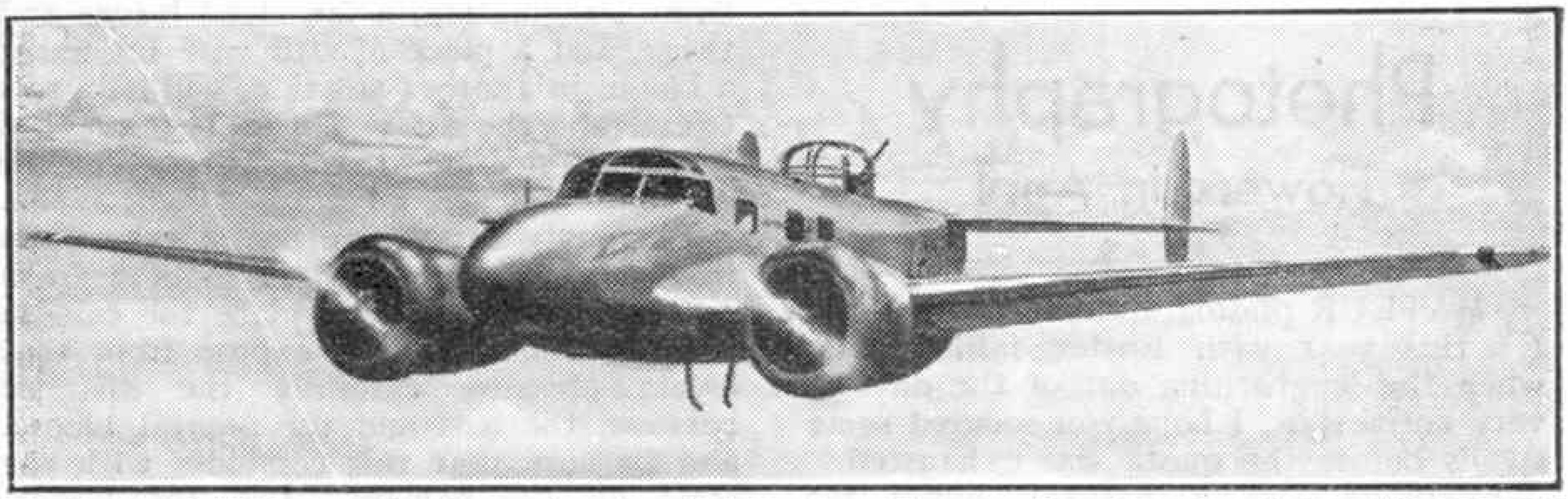
Davy's fame had now spread throughout Europe, and a very striking proof of this was the grant of permission to travel through France, a country with which we were at war, in order to meet French scientists. This permission was given by Napoleon, who himself was interested in scientific work, and had offered a medal and a prize of about £120 for the best discoveries in electrical science each year. This prize had been awarded to Davy, an unexpected recipient for a French Imperial award during a state of war.

Although Davy had now retired from active work in the Institution, he continued his scientific researches, both during his long tour of the Continent and on his return. While in Paris he was given specimens of a new substance that had been isolated from seaweed and was remarkable for its glittering crystalline appearance and for the deep violet fumes that it gave when heated. He quickly proved this to be a new element, similar to chlorine, and it is the one now known as iodine. Italy too was included in his tour. There he climbed Vesuvius in order to put to the test the theories of volcanic action that he had worked out, and he also analysed the pigments used by great Italian artists. While in Italy he met Volta, the discoverer of the voltaic battery, and thus there came together the man who first provided means of obtaining continuous electric currents and the one who made the most striking and original use of this new force. It is recorded that for the visit Volta arrayed himself in gorgeous official uniform in order to make a real ceremony of the occasion, and was so startled by the modest and ordinary appearance of his visitor, who was always somewhat careless in dress, that for a few moments he was speechless.

Davy returned to England in 1815, and almost immediately his attention was drawn to the disastrous effects of explosions of fire-damp in coal mines, which were then being driven more deeply into the Earth. Accumulations of gas were readily ignited by the candles used by miners, and there were many violent explosions, with heavy death rolls. Davy was urged to find some means of providing lights that would be safe underground, and immediately set to work with samples of fire-damp collected for him. He quickly discovered that the flame of the burning gas would not travel through narrow tubes, and his next discovery was that the length of the tubes did not matter, so that a fine wire gauze was effective in preventing the passage of the flame. This is shown by a well-known experiment illustrated on this page, in which a sheet of wire gauze is placed horizontally an inch or so above a Bunsen burner. When the gas is turned on it can be ignited above the gauze by means of a lighted taper, the stream of gas underneath the gauze remaining unlit.

With this as a guide Davy constructed his first safety lamps. In them an oil burner was made the base, and above it was a cylinder of gauze that surrounded the flame, the top being closed and provided with a hook or handle for carrying. These early lamps, crude as they were, could safely be lowered when lit into explosive mixtures of fire-damp and air. As experience was gained they were greatly improved in detail, and the drawing on the right-hand side of the illustration on this page gives a good idea of their construction.

Davy's lamp suffered from one drawback; if the gauze became red hot at any point the flame could pass through it. The experiment already described can be varied to illustrate this by igniting the gas from the Bunsen burner below the gauze instead of above it. The flame does not then pass through until the gauze becomes red hot. Because of this defect the lamp was not reliable in mines where there was an air current of sufficient strength to blow the flame to one side, so that it heated the gauze. In time this difficulty was met by surrounding the flame with a (*Continued on page 142*)



The Lockheed 212 twin-engined monoplane in which the dramatic escape from Java described on this page was accomplished. Photograph by courtesy of the Lockheed Aircraft Corporation, U.S.A.

Escaping the Japanese Invader

From Java to Ceylon in a Patched-up Aircraft

THE story of how a young Cadet-Pilot of the Netherlands Indies Air Force, and four other men, escaped from Java to Ceylon in an old Lockheed machine they found and patched up, and of their encounter on the way with Japanese bombers, has been told by W. van Hoogland, LL.D., of the Netherlands Indies Air Force, who is now serving as an instructor in the Royal Netherlands Military Flying School at Mississippi, U.S.A.

Cadet-Pilot Pelder was marooned with two Australian soldiers, a Canadian, and a New Zealander, in a village on the coast of Java. They found there a deserted aerodrome with some damaged aircraft scattered about it, one of which was the first Lockheed 212 twin-engined military aeroplane delivered to the Netherlands Indies Government in the spring of 1939. It now lacked the tail, which had been bombed off, and a gun was missing from the turret. The party of men came across another Lockheed 212, the wings and fuselage nose of which had been smashed, but which had a sound tail unit. Using a sixpence as a screwdriver and undoing nuts with a pair of pliers, Pelder and his companions managed to transfer this tail unit to the other less-damaged machine, and secured it in place with ropes. They found a couple of machine guns lying about, and fitted one of them in the turret and another in the fuselage nose, firing forward. Fortunately they had brought plenty of machine gun ammunition with them.

There was a good supply of petrol in drums around the aerodrome, and from these they filled the wing tanks, with the aid of a pump they found. Searching the field again they came across a couple of spare wing tanks, each of 40-gall. capacity, and after plugging up some holes in them with bits of wood and cork, they strapped the tanks inside the fuselage with lengths of bamboo and string. One of the men made a hole in the side of the fuselage with a hand axe and a pair of bolt cutters, and a piece of hose that had been found was pushed through the hole and one end jammed into the tank in the wing. Next they fitted a steel rod from the fuselage to the tank and tied the hose to it to prevent the slipstream from blowing it out. The idea was to feed petrol through the hose, with the aid of an improvised funnel, from the tanks in the fuselage.

After working out the range of the doctored aircraft, and taking into account the extra tanks, the men found that they could not quite reach Australia. They therefore decided to make for the island of Sumatra and refuel there. After a hazardous take-off, during which they had to zig-zag around bomb craters on the aerodrome, they headed up the coast of Java for Sumatra, and landed first at Medan, and then at a place called Klug-now, on the northern tip of the island. After refuelling there they made ready to take-off for Ceylon, some 1,200 miles away. Just as they were taxying across the aerodrome nine Japanese bombers swooped down to bomb it. Half-way across the field the Netherlands pilot spun the old machine round on one wheel, and taxied down to the other end of the aerodrome, intending to take off in that direction. The prospect (*Continued on page 142*)

Photography

Flowers in April

By A.R.P.S.

AMATEUR photographers are favoured this year with Easter falling late, when the lengthening out of the days is very noticeable. I hope you secured some spools before the quota was exhausted.

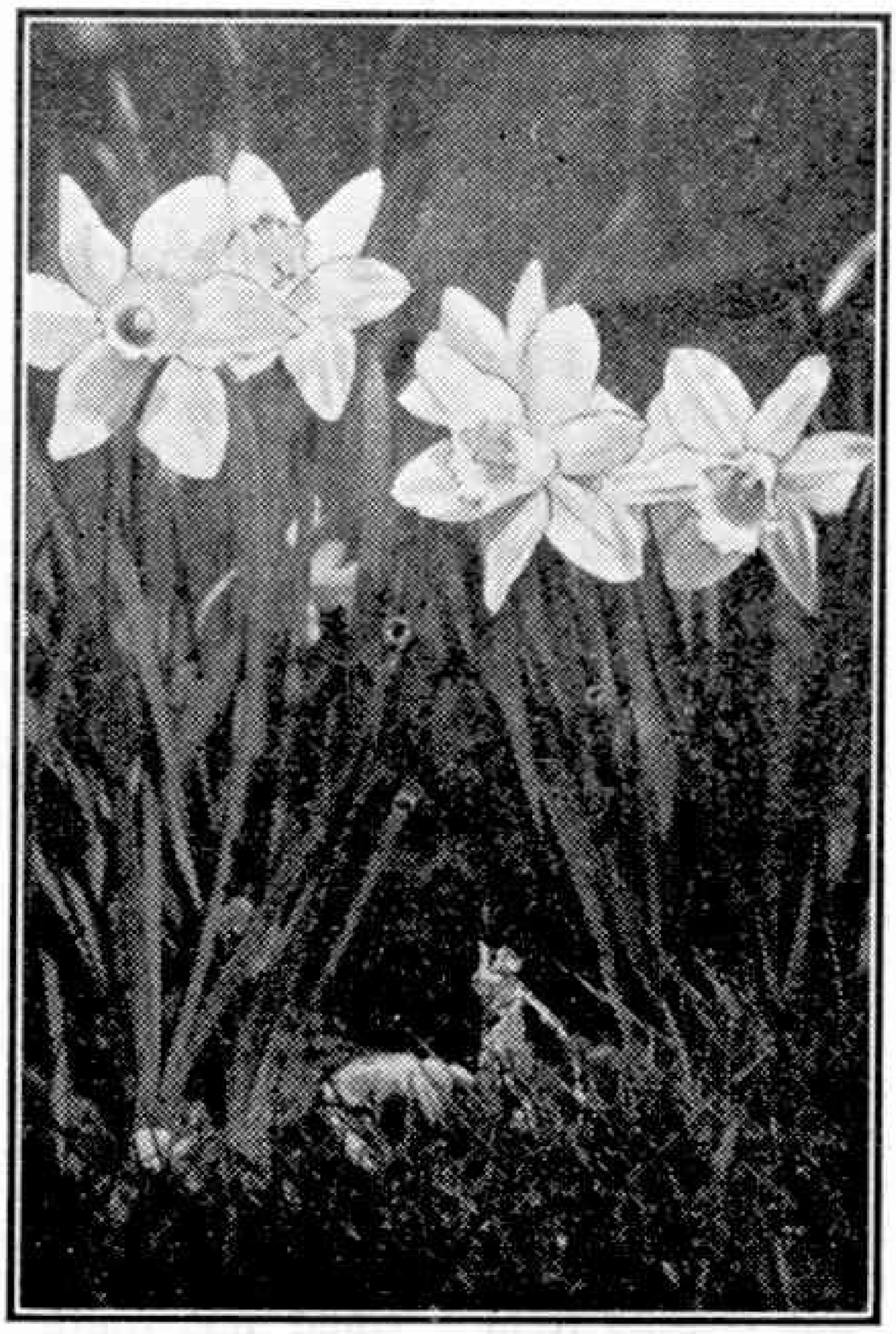
Everyone has a natural liking for flowers, especially the Spring ones, and I think it is always worth while making a few shots of them as a break-away from the more ordinary subjects.

When you see a bunch of primroses or narcissi in the woods you will notice natural characteristics about each bloom, the way it holds itself, how it is turned to the sun. Yet no one bloom overpowers another; in fact there seems to be an understanding between them to do all they can to make perfect harmony.

It is just this harmony that one should strive to achieve when making flower studies. In the woods the arranging is more or less done for us, but it is still necessary to consider points before exposing. There is still the lighting; there may be a heavy shadow across the blooms or they may be too close; there may be some clearing of dead rubbish in the foreground to be done, but do not be too drastic about this. A few minutes' wait will probably give a ray of sunlight and produce the effect you require.

Spring flowers growing in gardens have not always the helpful "naturalness" of those in the woods. Usually the bulbs have been planted in too set a manner, but a suitable little group in the corner or under the tree can usually be found. Some imagination, a few dead leaves and twigs, and a piece of stiff wire for fixing a bloom in another position, will help you to assemble the study. Do not be influenced by large clusters, better effects can be obtained with a small group of eight or ten.

I strongly advise you not to take them from a high angle, that is, looking down on them; but rather to place the camera on the ground and to expose from that level. Measure carefully the distance between the lens and the nearest bloom, and be sure that this coincides with the scale on the camera. Use the largest stop in order to throw the background out of focus and to get a soft effect. If your distances are correct the blooms will be in focus, but that ugly fence or other obstacle will be "fuzzy" and a more natural result will be achieved.



White daffodils in the garden, photographed with the camera on the ground.

It may be that the only flower studies that some of you can make must be done with cut blooms bought from a florist; in this case everything depends on you. The selection and the arrangement of the blooms in a vase is definitely a personal matter, but if you have artistic taste you will know not to crowd the flowers, but to use a few heads only, and to let each one be posed as naturally as possible. If the room is well lighted the exposure can be made indoors, but I advise the open if possible, using a piece of black cloth as a background.

As an approximate guide to exposure for flowers in the wild I suggest the following data: Panchromatic film such as "Selo H.P.3," stop F8, time between 11 and 4 o'clock with sun shining, fairly open surroundings free from heavy shadows or dark objects—Exposure 1/50th. Larger stop, say F6.5, give 1/200th.

For the garden shot, 1/25th to 1/50th according to the light; and this applies also to the vase of flowers outdoors.

From Our Readers

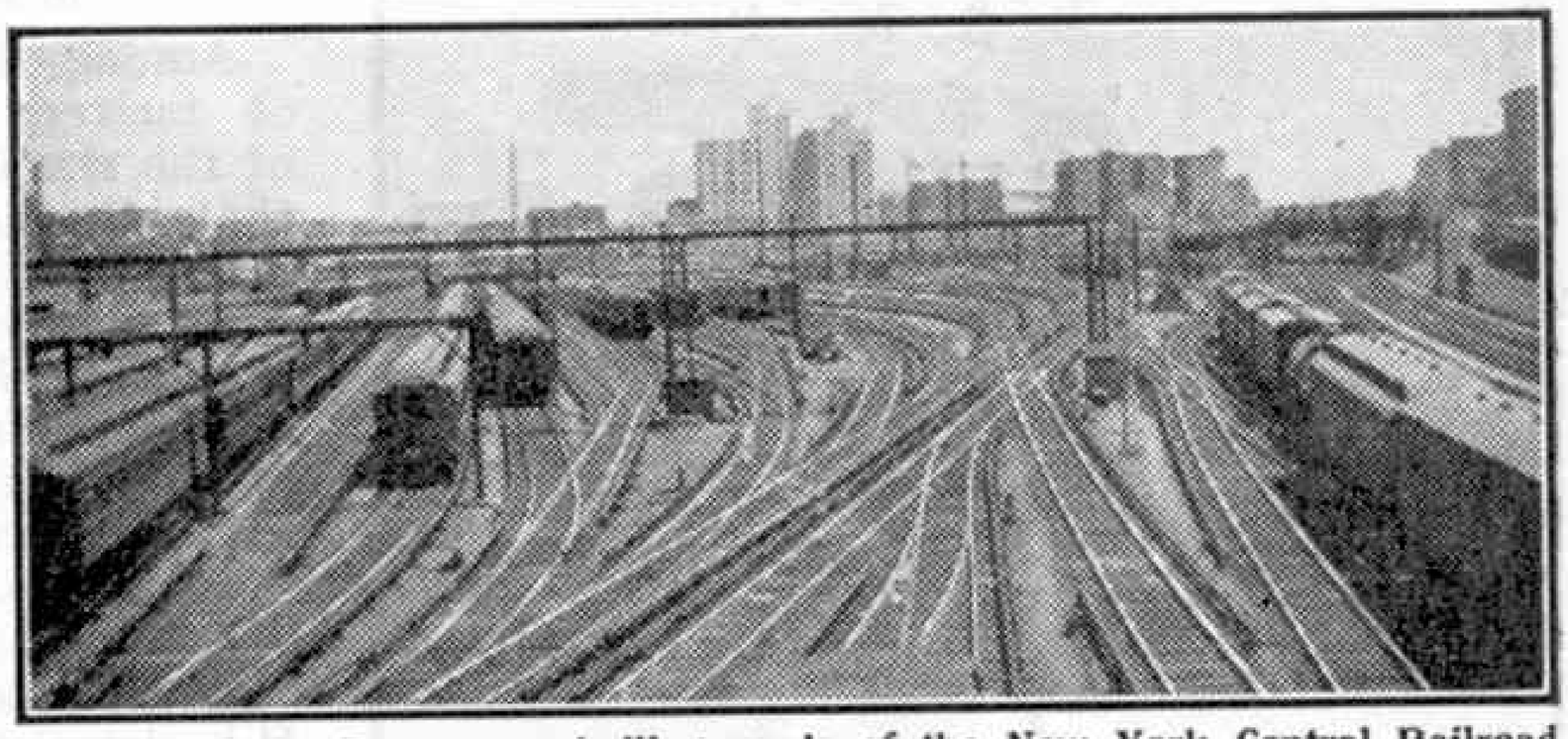
This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

HISTORIC WATER MILLS

Near Nottingham there are two very interesting old water mills. Castle Mill, near Linby, rebuilt in the 18th century, stands on the site of one mentioned in Domesday Book. Corn was ground here for the monks of Newstead Abbey, and until recently the mill boasted one of the largest wheels in England, nearly 100 ft. round. It is said that here in 1785 James Watt set up the first engine he installed in a cotton-mill.

Together with this mill, another, between Conalstan and Lowdham, illustrated on this page, is infamous by reason of the child labour in use about 1800. It is thought that here came Robert Blincoe, one of about 80 waifs from St. Pancras Workhouse, who was seven years old when he arrived and whose treatment was so cruel that he became crippled and deformed. The churchyards in the locality give evidence of the fate of such children during this black period of English history.

F. Rodgers (Derby).



A view of the Bronx marshalling yards of the New York Central Railroad. Photograph by W. Finlay, Blackpool.

A GREAT NEW YORK STATION

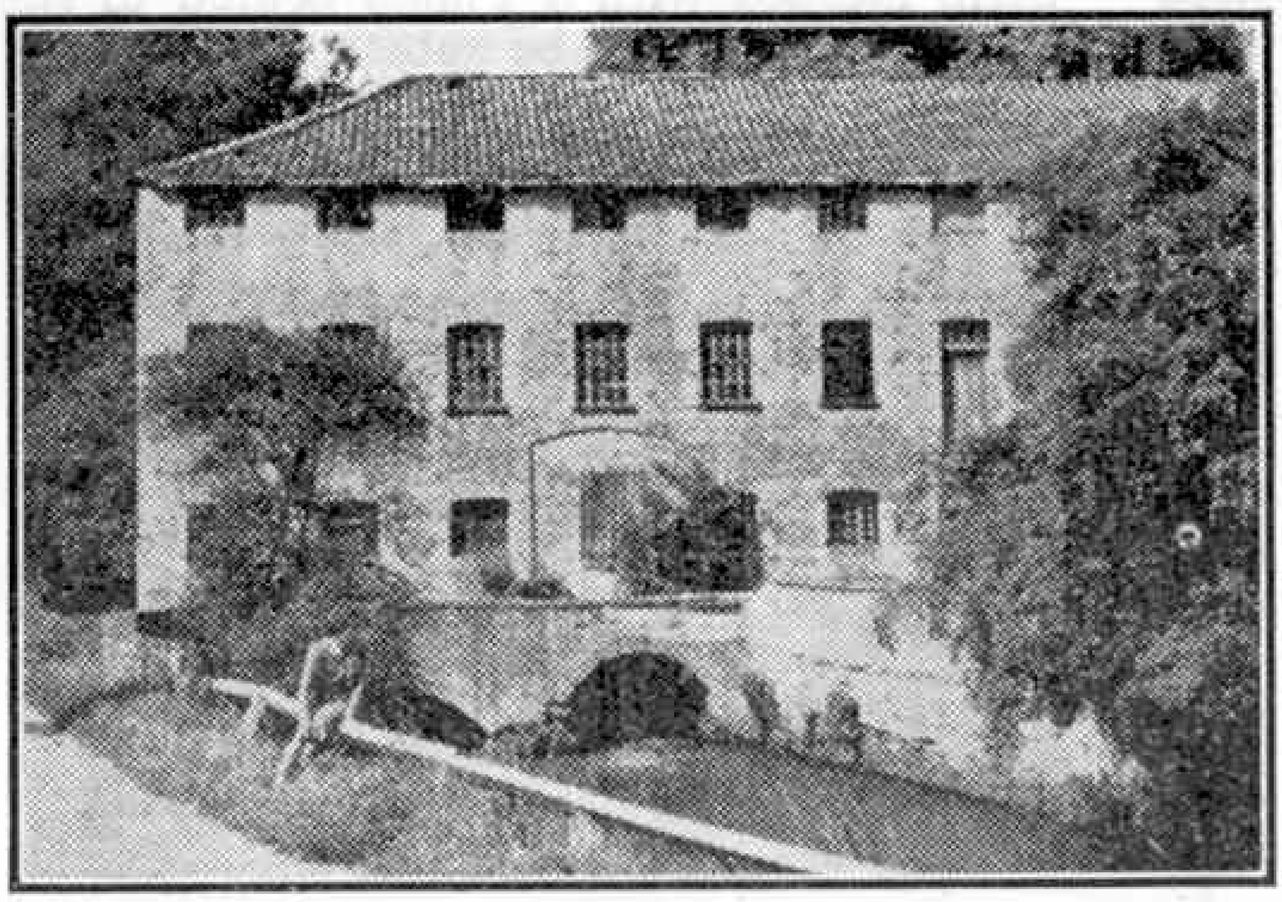
I happened to be in New York just before the war, and as my pet subject is railways I decided to have a look at Grand Central Station, of which I had heard quite a lot. This is situated on 42nd Street, in the heart of Manhattan Island, and is the terminus for the New York Central Railroad, and for the New York, New Haven and Hartford lines. I was greatly impressed, to say the least. The station is really two in one, having two levels, one for express trains on top and one for locals below it. I did not count the platform numbers, but I am sure I saw "Platform No. 52" on the lower level.

It would take a book to cover this station and its wonders, for it has a cinema, a railway museum, and an art gallery; its waiting rooms are the last word. What struck me most was the absence of steam and dirt. All trains entering or leaving Central Station are headed by electric locomotives, steam locomotives taking over the trains about 20 miles outside the city.

As I strolled around the train entrances, observing passengers, and "Red Caps," or coloured porters, rushing for this train and that, I was impressed by such train names as *"The Merchants Limited," "The Detroiter," "The Yankee Clipper," "The 20th Century Limited."* The last-named, the pride of the New York Central, travels daily in each direction between New York and Chicago.

As I came out on 42nd Street again I realised that here was a mighty railroad and terminus, worthy of its founder, Commodore Vanderbilt.

W. Finlay (Blackpool).



An old water mill near Nottingham. Photograph by F. Rodgers, Derby.

THE "RAND TRAM"

Although the Witwatersrand is chiefly known for its gold production, it was actually the discovery of coal on the Reef that first attracted the attention of the mining industry. Coal mines were established in 1881 at Boksburg, where a seam 16 ft. in thickness was located, and they became doubly important when gold was discovered in 1886, as the fuel was necessary for the working of the gold mines. At first the coal was carried by transport riders, but in 1886, after much urging, the Transvaal Government granted a concession to the Netherlands South African Railway Company for the construction of a tramway. The 15-mile stretch of railway line then built was known as "The Rand Tramway." The first passenger train ran in March 1890, taking an hour and a half for a run that to-day takes about 25 minutes. The charge for transporting coal was £8 a ton, and in spite of the high cost, the "Rand Tram" carried nearly 157,000 tons in its first year. The line was not a difficult one to work, for the steepest gradients were 1 in 100.

In 1892 the newly-laid line from the Cape met the "Tramway" at Germiston, and this junction began to grow in importance. In 1910 the line was merged in the Government Railways.

I. Benjamin (Germiston).

Suggestions Section

By "Spanner"

(592) Winder for Elastic Aeroplane Motors

(T. Lucas, London)

The winder shown in Fig. 592 is designed for winding elastic motors of the type used to drive the propellers of model aeroplanes. In it two arms, or pins, driven through step-up gearing from a handle, engage the propeller and rotate it as they revolve.

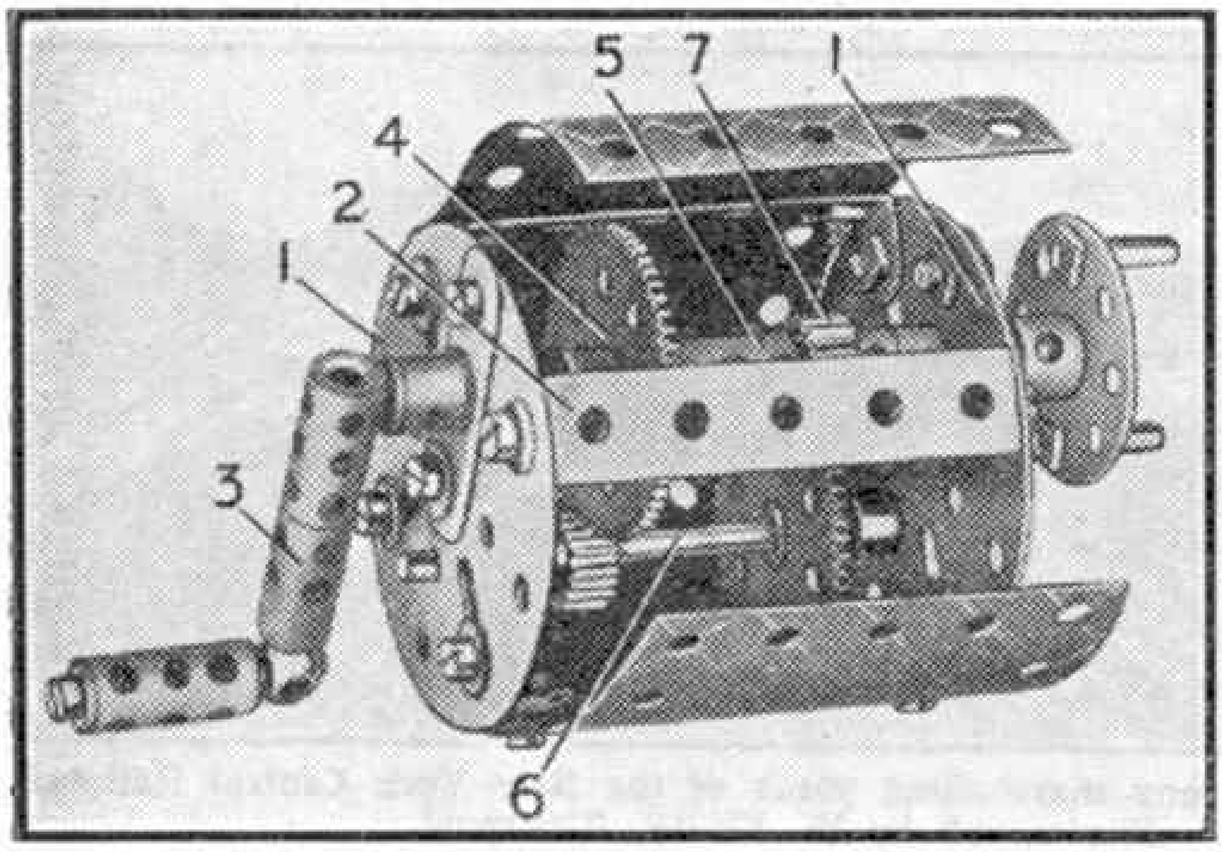


Fig. 592.

The bearings for the various shafts are formed from two Face Plates 1, which are spaced apart by $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips, one of which, 2, is held in place by two Threaded Bosses. The handle 3 is formed from a Coupling that is lock-nutted by a $1\frac{1}{8}''$ Bolt to a Handrail Support fixed to a Threaded Coupling. The latter is connected by a 1" Rod to a Coupling fixed on the end of a 2" Rod mounted in a Double Arm Crank, which is bolted to the left-hand Face Plate 1 and also carries a 57-teeth Gear 4. A Coupling 5 fixed on the end of this Rod provides a bearing for the driven shaft. The Gear meshes with a $\frac{1}{2}''$ Pinion on a 3" Rod 6, journalled in the Face Plates 1, which carries also a 57-teeth Gear meshing with a $\frac{1}{2}''$ Pinion 7 that is fixed on a 2" Rod inserted in a Double Arm Crank bolted to the right-hand Face Plate 1 and the Coupling 5. The 2" Rod carries at its outer end a Bush Wheel, in which two Threaded Pins are secured to form the arms that engage the propeller blades.

The device is completed by bolting four large radius Curved Plates to the Double Angle Strips spacing the Face Plates 1, the last two Plates being held by Bolts screwed into the Threaded Bosses of the Double Angle Strip 2.

(593) A Novel Motor Horn

(R. Roberts, Manchester)

Among the many different types of buzzers and motor horns one of the simplest and most popular is that in which a flexible metal plate is vibrated rapidly by a rotating toothed wheel. This may be represented in Meccano by a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate 1 bolted as shown in Fig. 593 to a $1'' \times 1''$ Angle Bracket, attached to one of the sideplates of an E6 or E20b Electric Motor. The Plate is bent round at its other end to make contact with a Ratchet Wheel mounted on a Rod journalled in the Motor sideplates. This Rod is driven through a 1" Pulley fixed on its other end and connected by a $2\frac{1}{2}''$ Driving Band to a $\frac{1}{2}''$ Pulley fixed on the armature shaft of the Motor.

A contact screw 2 for the vibrating plate is provided by a $\frac{1}{2}''$ Bolt that is locked in a Handrail Support fixed to a Threaded Boss bolted to the Motor sideplate, but spaced from it by two Washers. By adjusting this Bolt the pitch of the note produced may be varied. The intensity of the sound produced may be altered by reversing the Motor. If an Electric Motor is not available, a Rack Strip meshed with a Pinion geared to the Ratchet shaft may be substituted.

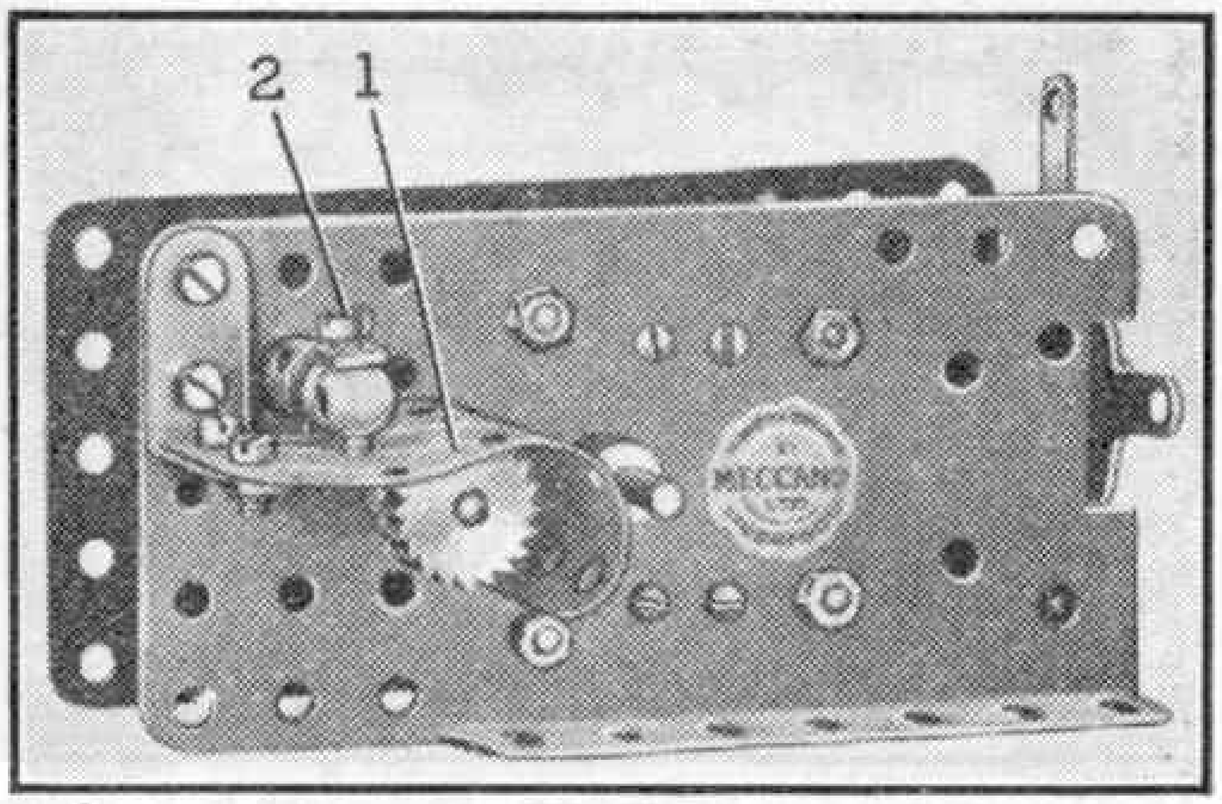


Fig. 593.

(594) Toggle Link Mechanism for Beam Engines

("Spanner")

A novel mechanism that is designed to produce two revolutions of a crankshaft for each stroke of a piston rod is shown in Fig. 594. The device incorporates a toggle-link mechanism and was originally designed for use with beam engines.

The mechanism consists of a link that is pivotally connected to the piston rod and is also attached to the connecting rod fitted to the beam of the engine. In our model this link is formed from a 1" Screwed Rod 1 locked in the tapped bore of a Collar lock-nutted to two $\frac{1}{2}" \times \frac{1}{2}"$ Angle Brackets bolted to the base. The Screwed Rod is fitted at its upper end with a Rod and Strip Connector that is also lock-nutted to Rod and Strip Connectors attached to the piston and connecting rods 2 and 3. Through this arrangement movement of the connecting rod causes the ends of the beam to move up and down during one half-stroke of the piston, so producing one revolution of the crankshaft operated from the other end of the beam.

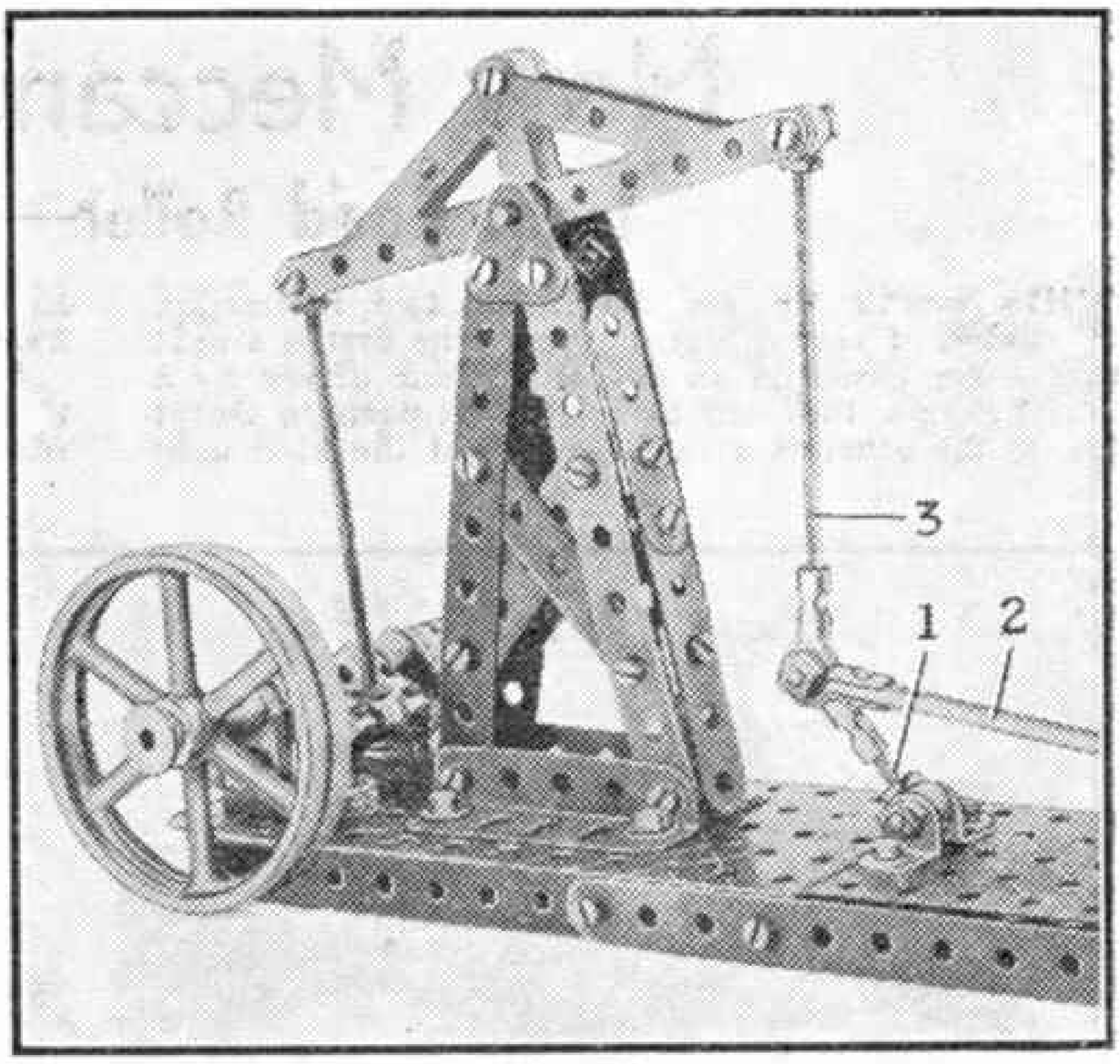


Fig. 594.

(595) Low Friction Bearing

("Spanner")

An interesting and useful application for the Meccano Steel Ball, part No. 117, is shown in Fig. 595, where it provides a support for the lower end of a vertical rotating Rod. The Steel Ball 1 is mounted on the casing of a Spring Buffer 2 bolted to a Plate on which the Rod is to be vertically supported. The Rod may be journalled in a Double Arm Crank attached to this Plate and fitted at its lower end with a $\frac{3}{4}"$ Flanged Wheel 3 so that the Steel Ball fits into the boss of the Wheel.

A bearing of this type is suitable for carrying Rods in this position in many different kinds of models, and will be found to work quite smoothly even when heavy wheels or other loads are mounted on the Rod. In the illustration the Rod is fitted with a built-up wheel formed from 6" Circular Plates bolted to a Hub Disc.

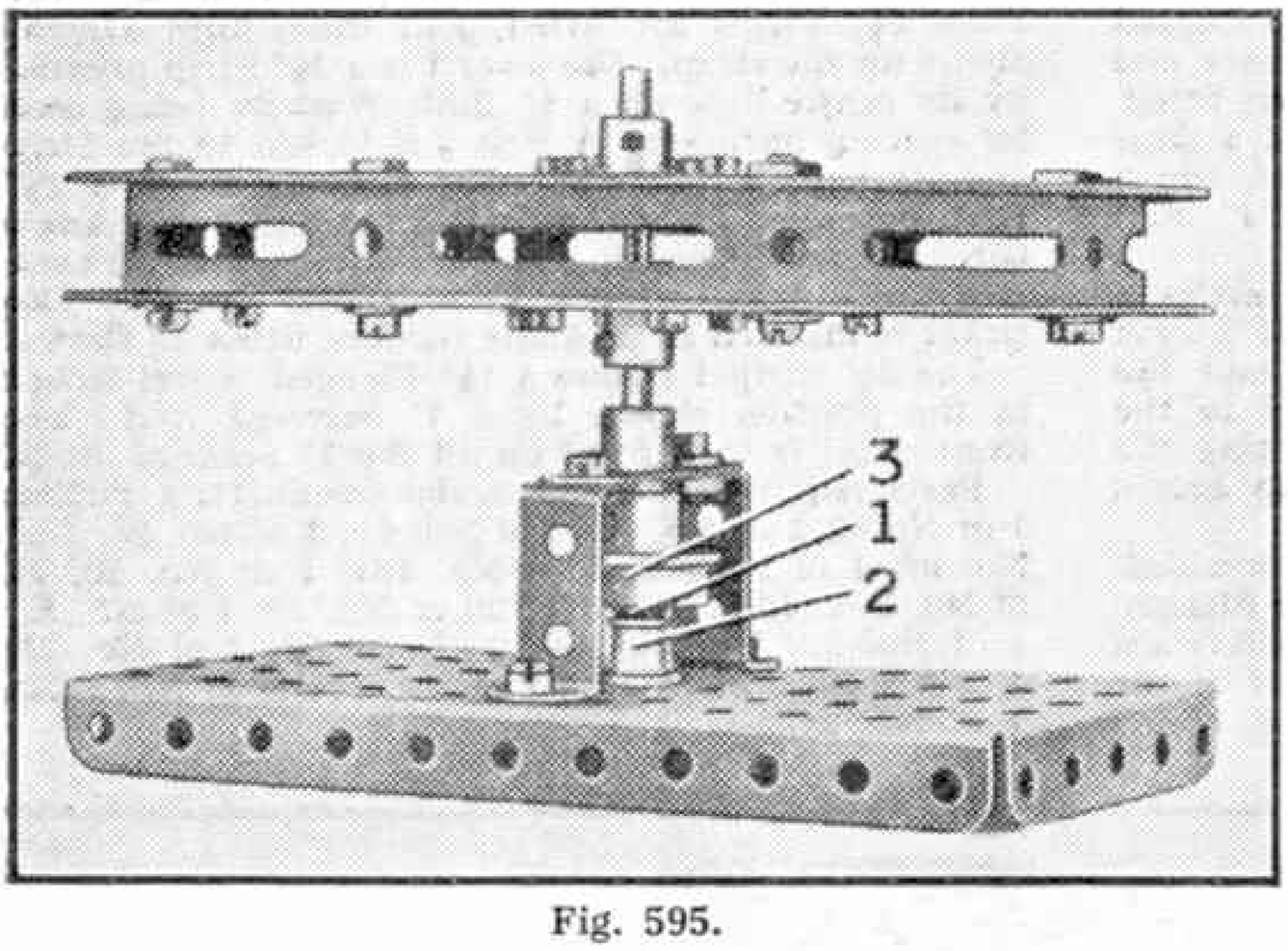


Fig. 595.

(596) A Small Electro-Magnet Made of Meccano Parts

(N. Tudor, Birkenhead)

Model-builders requiring a small electro-magnet for incorporation in electrical mechanisms will find the magnet described here suitable for many applications. It is built up around two Double Brackets, which form the core. The Brackets are held together by two pieces of cardboard with narrow slots about $\frac{1}{2}"$ in length cut in their centres. The two Brackets are placed end to end and the pieces of cardboard are dropped over their inner ends. On turning the Brackets round until they are back to back, the pieces of cardboard slip into position and are then placed one at each end of the Brackets. A strip of paper is wound round the Brackets and glued in position before winding on the wire, and it will also be found necessary to insert securing Bolts into the end holes of the Brackets before winding is commenced.

New Meccano Models

Light Road Roller—Ticket Punch

THIS month we are describing two interesting models of very different types. The first is a neat road roller based on an actual machine driven by a Diesel engine, that can be built from parts in Outfit No. 5; the other is a ticket punch of the kind used by bus and tram conductors.

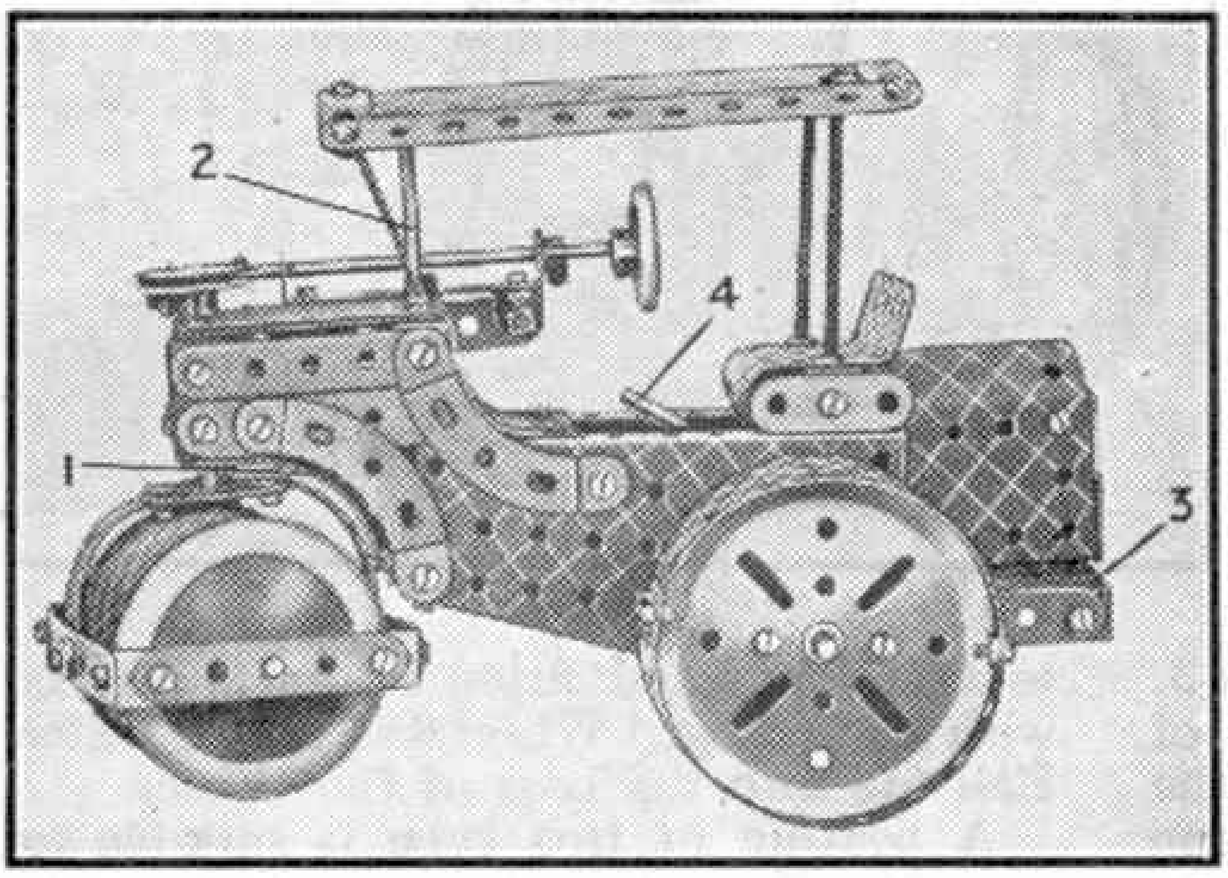


Fig. 1. Outfit No. 5 contains all the parts required to build this sturdy Diesel Roller.

When building the road roller, which is shown in Fig. 1, it is best to commence by assembling the chassis. Two 4½" Flanged Sector Plates are bolted by their lower flanges to one hinge of a Hinged Flat Plate and are fitted at each side with 2½" Strips and Cranked Curved Strips, as shown, attached to 2½" × ½" Double Angle Strips. A large radius Curved Plate 1 is attached by Obtuse Angle Brackets and ½" × ½" Angle Brackets. The front top is then fitted.

The roller is a 5½" × 2½" Flexible Plate and a large radius Curved Plate bent to form a cylinder, which is held between two Road Wheels on a 4" Rod mounted in the chassis as shown.

The steering column is a 5" Rod, which carries a Cord Anchoring Spring fitted with a short length of Cord, which is passed a few times around the Rod and then around a 1" Pulley attached to the front roller unit. A 3½" Rod 2 for supporting the canopy is mounted in a Double Bent Strip bolted underneath the front top.

The mounting for the engine unit is now assembled. A *Magic* Motor is fitted to the 2½" × 1½" Flanged Plate 3. The Motor is attached also at its forward end to a 1" × 1" Angle Bracket bolted to one of the Flanged Sector Plates. Two Flat Trunnions bolted together to a 1½" Disc, are fitted at the back of the Motor by a 1" × 1" Angle Bracket, and a 1½" × ½" Double Angle Strip bolted to their upper ends is fitted with a 2½" × 1½" Flexible Plate and a U-section Curved Plate.

Each of the rear rollers consists of two 5½" × 1½" Flexible Plates fitted around a 3" Pulley, to which they are attached by ½" Reversed Angle Brackets and ½" × ½" Angle Brackets. A Road Wheel is fitted inside each roller, which is then mounted on a compound axle formed from a 2" and a 3½" Axle Rod joined by a Rod Connector.

A 2½" Driving Band on the Motor pulley drives a 1" Pulley on a 3½" Rod journalled in the Flanged Sector Plates. This Rod carries a ½" fixed Pulley, coupled by a 2½" Driving Band to a 1" Pulley on the rear axle. The brake consists of a 1½" Rod 4 inserted in a Rod and Strip Connector bolted to the Motor brake lever.

The canopy is a 5½" × 2½" Flexible Plate bolted at each end to 3" Formed Slotted Strips and edged along its sides with 5½" Strips. This structure is supported at the rear end by 3" Screwed Rods. At the front the canopy is fitted with four Flat Brackets which also fit over the 3½" Rod 2 and is braced by Cord.

Parts required to build model Diesel Roller: 2 of No. 2; 2 of No. 3; 12 of No. 5; 2 of No. 6a; 6 of No. 10; 2 of No. 11; 12 of No. 12; 2 of No. 12a; 2 of No. 12c; 1 of No. 15; 1 of No. 15b; 3 of No. 16; 2 of No. 17; 1 of No. 18a; 2 of No. 19b; 4 of No. 22; 1 of No. 24; 8 of No. 35; 91 of No. 37a; 85 of No. 37b; 12 of No. 38; 1 of No. 40; 1 of No. 45; 1 of No. 48; 6 of No. 48a; 1 of No. 51; 2 of No. 54a; 2 of No. 80c; 4 of No. 90a; 4 of No. 125; 2 of No. 126a; 1 of No. 155a; 1 of No. 176; 1 of No. 186; 4 of No. 187; 1 of No. 188; 4 of No. 189; 4 of No. 190; 2 of No. 192; 1 of No. 198; 1 of No. 199; 2 of No. 200; 1 of No. 212; 1 of No. 213; 4 of No. 215; 1 of No. 217a. 1 *Magic Motor* (not in Outfit).

The ticket punch shown in Fig. 2 will pierce holes in thin paper, and this action is followed by the ringing of a bell, as in a real tram conductor's punch.

A 3½" × 2½" Flanged Plate forms the base and is fitted top and bottom with 3½" Angle Girders, that at the top being held in place by 1" Screwed Rods. To the ends of these Rods that project through the Plate 1½" Strips are fitted, and these form attachments for the strap. The lever 1 is a 3½" Strip pivoted by its centre hole on a ¾" Bolt, Washers being used for spacing purposes. A Bolt 2 is locked to the Strip and its head engages a Collar 3 mounted on a 1½" Rod journalled in an Angle Bracket and a 1½" Angle Girder locked at one end to the Plate by a 1" Screwed Rod, and fitted with a Compression Spring. The ticket is inserted in 2" Angle Girders, fitted as shown.

The 3½" Strip 1 strikes a 1⅛" Flanged Wheel locked in the position shown by a 1" Screwed Rod. The front cover is then fixed on all the 1" Screwed Rods.

Parts required to build model Conductor's Punch: 1 of No. 3; 2 of No. 6a; 2 of No. 9b; 2 of No. 9e; 1 of No. 9f; 1 of No. 12; 1 of No. 18a; 1 of No. 20; 26 of No. 37a; 15 of No. 37b; 26 of No. 38; 1 of No. 51; 1 of No. 53; 1 of No. 59; 2 of No. 64; 1 of No. 73; 4 of No. 82; 2 of No. 90; 1 of No. 111; 1 of No. 120b; 1 of No. 215.

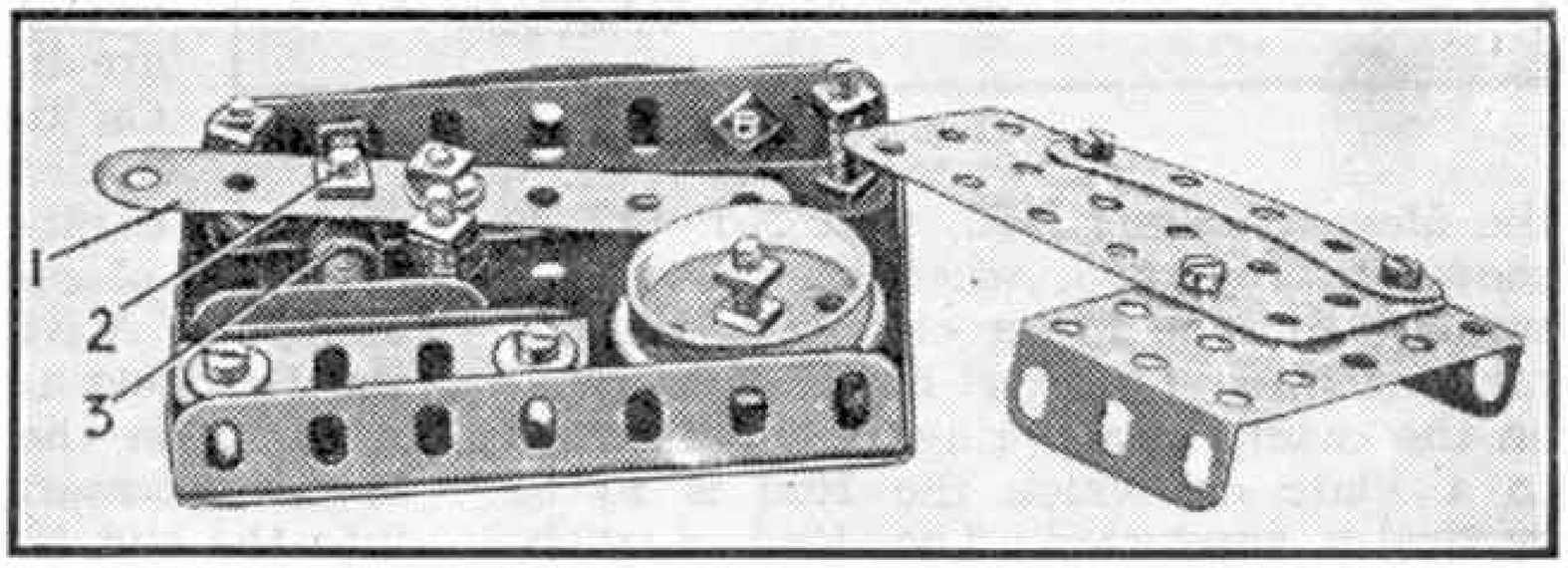


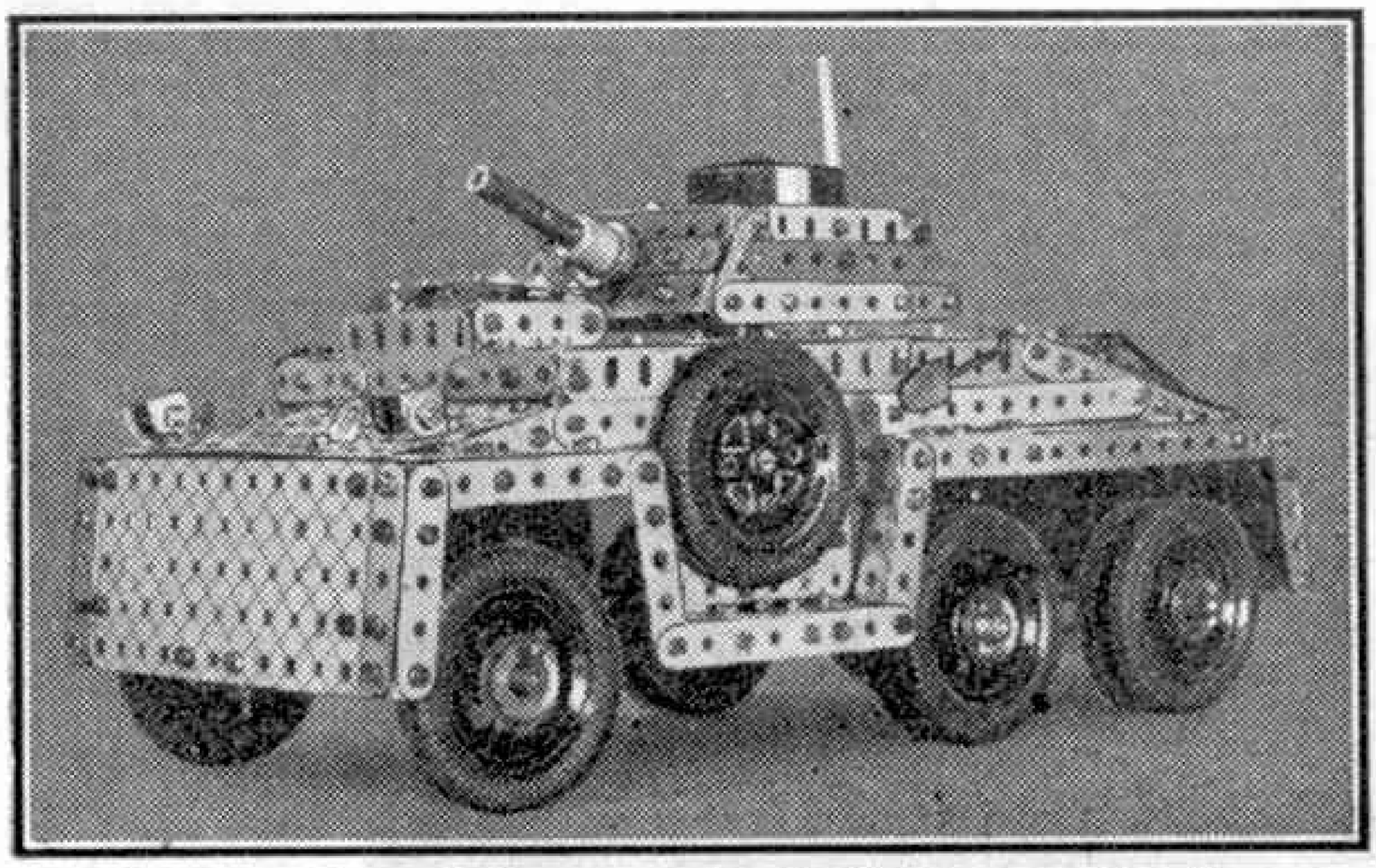
Fig. 2. A simple but realistic model of a conductor's bell punch.

Meccano Model-Building Competitions

By "Spanner"

Handsome Prizes for Suggestions

One of the greatest advantages of the Meccano system is its flexibility. On the one hand its ingeniously designed parts can readily be built up into structures of every possible kind, and on the other each of the parts themselves is capable of many different applications. Model-builders have always showed great ingenuity in adapting the parts to different purposes, and this is particularly notable nowadays, when lack of new parts has compelled model-builders to find novel ways and means of building up their structures and mechanisms. This therefore is a good time to look for suggestions that will help all.



A neat armoured car that won a prize for H. Simpson, Grantham, in the Outfit Model-building Contest, the results in the Home Section of which are announced on this page.

The devices we have in mind are those suitable for inclusion in the *"Suggestions Section"* of the Magazine, and we are offering handsome cash prizes for the best submitted to us by readers. Clutches, locks, automatic grabs for cranes, gear-boxes and reversing, free wheel and brake mechanisms showing novelty in the uses of parts, are typical suitable entries for this contest.

Entries should take the form of photographs or good drawings, with explanatory notes where necessary, and they should be addressed *"April Suggestions Competition, Meccano Limited, Binns Road, Liverpool 13,"* There will be two sections, Home and Overseas, and in each the prizes will be £2/2/–, £1/1/– and 10/6, with consolation awards. Closing dates: Home, 30th April; Overseas, 31st August.

Model-Building Contest Results

Examination of the entries in the Home Section of the recent Outfit Model-building Contest, announced in the *"M.M."* for November and December last, revealed that an overwhelming majority of model-builders had designed simple models built from the parts contained in the smaller Meccano Outfits in preference to constructing large and intricate models. Construction throughout was excellent, and it was clear that competitors had given much thought to their models, revising and simplifying these until they were fine examples of sound workmanship.

The names of the prize-winners are given in the following list:

1st, Cheque for £2/2/-: D. Harney, S. Shields; 2nd, Cheque for £1/1/-: E. Rusted, Nuneaton; 3rd, P.O. for 10/6: H. Simpson, Grantham.

Consolation Prizes of 5/- each: D. Portman, S. Croydon; J. A. Kennett, Gerrards Cross; D. Parker, Exeter; B. Poole, Thornton Heath; Q. Dennison, Bradford.

A well-designed model destroyer won First Prize for D. Harney, South Shields. This is constructed from the parts in Outfit No. 9 and in it clear lines have been neatly obtained by the use of Flexible Plates. It is 6 ft. long and is fitted with two funnels. Notable features are rotating pom-pom guns, torpedo tubes and depth charges, with a catapult mechanism for ejecting the last named from the stern.

E. Rusted, Nuneaton received Second Prize for a model field gun unit comprising an Army truck, limber and field gun. The truck presents a sturdy appearance which is enhanced by the snub nose, a common feature of present-day lorries. It is of the tarpaulin-covered type with an open cab, and it may be powered by an E120 Electric Motor. Construction of the limber and gun too is excellent, yet close scrutiny of these reveals the fact that the majority of the parts used are found in the smaller Outfits. The gun is fitted with a powerful firing mechanism that "fires" Washers. This fine entry is built from parts in Outfit No. 8.

Our illustration shows a sturdy model that earned Third Prize for H. Simpson, Grantham, and readers can see for themselves what a realistic appearance has been attained by the careful use of Strips.

A fine double-decker bus constructed from parts corresponding to those in No. 5 Outfit was submitted by Q. Dennison, Bradford, a Consolation prize-winner. The steering gear is of the forward control type, the column being connected by a right-angle movement to the track rod, which in turn is pivotally attached by links to the stub axles of the front wheels. The general appearance of the model is greatly enhanced by the clever edging of Flexible Plates with Strips.

A neat saloon car that is designed for Outfit No. 5 obtained a Consolation Prize for B. Poole, Thornton Heath, and a similar Prize was awarded to D. Parker, Exeter, for a simple but nevertheless original entry showing what is supposed to be a Meccano part manufacturer at work at his bench. It scarcely corresponds to the real thing, but is a very praiseworthy effort. The model can be constructed from Outfit No. 3 and a neatly topical touch is given by a "V for Victory" sign that is attached to the front of the bench and consists of 2½" Strips, forming the V-shape and "dash," with Washers for "dots."

Club and Branch News

WITH THE SECRETARY

THE GUILD IN MALTA, G.C.

At such a time as this we cannot do better than turn our attention to Malta, G.C. The award of the George Cross to the island is a fitting tribute to the courage and determination that the Maltese showed during the long and memorable siege they underwent, and members of the Guild and of the H.R.C. will be proud to know of the share of the Lasallian M.C. in this.

I heard many stories of the island's ordeal from Bro. Hilary, a member of the Club who visited me a short time ago, and further news has just reached me in a letter from Bro. Anthony, Leader of the Club, writing from "the most battered fortress in the whole British Empire," but looking forward to victory and also to the expansion of the work of the Club, which indeed has never ceased activity in spite of all difficulties. Many of the senior members have been engaged continuously in war work of various kinds, and in this they have given the utmost satisfaction, which is exactly what we should expect from Guild members. In the meantime all kinds of games and fun have been enjoyed. The chief game played has been football, and air rifle shooting has been taken up, members showing skill in keeping with the traditional powers of Maltese artillerymen. Model-building also continues, and the Club is even contemplating an exhibition.

To the courageous officials and members of this Club in the very centre of the Mediterranean battle I send greetings and heartiest good wishes on behalf of all connected with the Guild and the H.R.C.

Members of the Tynecastle School M.C., Leader Mr. W. C. Stephen; Secretary, R. Paterson. This fine school Club follows an excellent programme of model-building. Members are particularly interested in the construction of scale models of aeroplanes, with elastic motors, and these are tested in actual flight round a pole to which they are attached by thread.

Recently Incorporated Branches

441. FOREST SCHOOL—Mr. C. B. Bardell, Forest School, Nr. Snarsbrook, London E.17.

442. KINGSTON-ON-THAMES—Mr. W. Kemp, 10, Cromwell Court, Kingston Hill, Kingston-on-Thames.

Proposed Branches

OXTED—Mr. C. G. Heaysman, Greenhurst, Mill Lane, Hurst Green, Oxted, Surrey.

HANLEY—Master E. Cooper, 3, Cranleigh Avenue, Sneyd Green, Hanley, Stoke-on-Trent.

SEALAND—Mr. D. Gill, 16, Green Lane, Sealand, Nr. Chester.

SUNBURY-ON-THAMES—Mr. J. M. Hayes, 8, The Parade, Sunbury-on-Thames, Middlesex.

Club Notes

CROSSLAND LODGE (HUDDERSFIELD) M.C.—Regular Meccano Nights have been held, and excellent models have been constructed. Aeroplane spotting is included in the programme and tests are arranged regularly. A Stamp Section has been formed. The Club has been successful in several football matches. Club roll: 11. *Secretary*: D. Graham, 19, Moorside Avenue, Crossland Moor, Huddersfield.

NAVENBY M.C.—Excellent progress has been made since affiliation was secured. Model-building Nights are held regularly, and new members are showing great enthusiasm. On one evening members brought games of all kinds to the Club and spent an enjoyable time with them. The greatest interest was shown in a Lecture on "*The Life Story of Meccano*." Club roll: 13. *Secretary*: P. I. Addison, High Street, Navenby, Lincs.

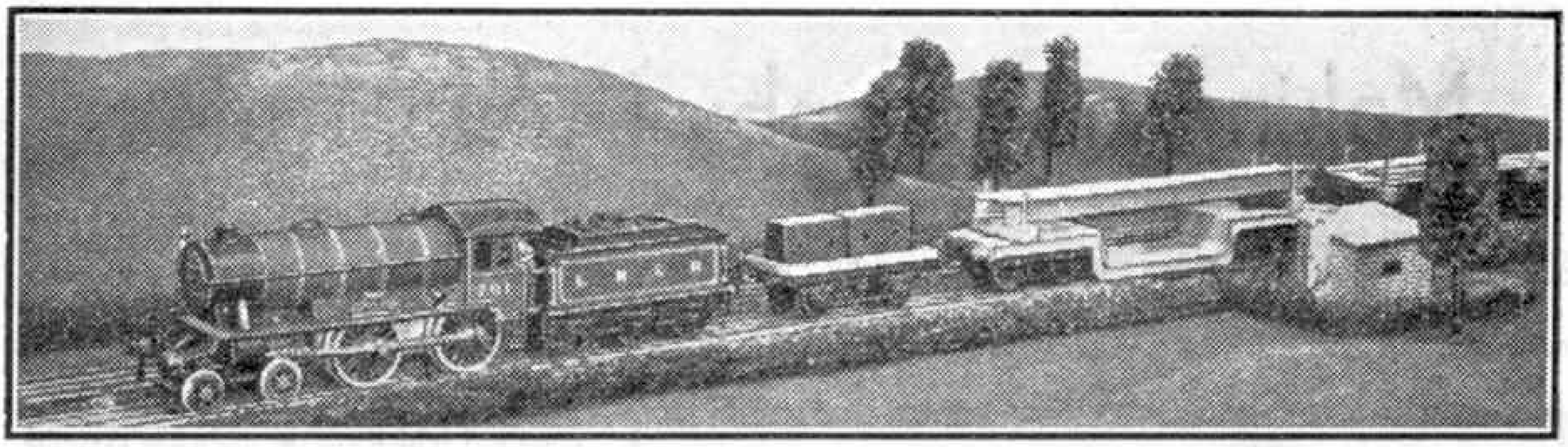
AUSTRALIA

MELBOURNE M.C.—Meetings continue to be held regularly in spite of war-time difficulties. At one of these a member described a 60-ton breakdown crane recently completed by the Victorian Railways. At others operations have been carried out on the Club's extensive Hornby Train lay-out. Each member is given a special post and there are "spare" drivers in readiness to take the places of regular drivers who make serious mistakes, causing derailments. At one meeting a special programme of operations was arranged for the benefit of visitors. This included a display of large working Meccano models as well as a demonstration of Hornby Train operation. Club roll: 12. *Secretary*: L. Ison, 8, Hayes Street, Northcote, N.16., Victoria, Australia.

Branch News

COCKFIELD (DURHAM)—The Branch railway has now been laid down and enjoyable operations are practised on it. At one meeting troop trains and out-of-gauge specials were run, Dinky Toys Tanks mounted on Flat Trucks forming excellent special loads. A very enjoyable party has been held. *Secretary*: I. Spence, Post Office Square, Cockfield, Durham.

WITHERNSEA—The varied programme has included the re-laying of the Branch track and operations on it. A special feature of the layout is a passenger station with four roads through it. Debates have been held and a visit paid to the local station, and Lectures have been given, including one on L.N.E.R. locomotives. *Secretary*: K. Purkins, "Basavie," Hollym Road, Withernsea, E. Yorks.



A special load on a Trolley Wagon forming part of a through freight train.

Mixed Freight for Hornby Wagons

IT is curious to find that although most miniature railway owners make a practice of loading up the goods wagons of their first train set, they tend to neglect the practice as the layout develops and further vehicles are added. This is a pity, for "loading up" adds greatly to the interest of any model railway operations.

Certain Hornby Wagons, such as the Coal Wagon, are already supplied with suitable loads, and no doubt many readers will still have "in stock" some of the Hornby Imitation Coal that was formerly available. This makes a splendid load that is light in weight and clean to handle. For open wagons, either the standard four-wheelers or the splendid bogie High-Capacity vehicles, it is very suitable, and it also looks well in the tenders of locomotives. In order to economise in the use of this "fuel" it is a good plan to make one or two "false bottoms" of thin card to fit in the vehicles, the actual load being spread over the top of the card just level with the wagon sides. This method can be used also where actual coal, or sand or small stones, form the load. The pieces of real coal or stones should be washed in water and allowed to dry before being glued to the false bottom. Such loads cannot be upset and perhaps be trodden into the carpet! In addition the weight is reduced in comparison with that of a complete wagon load, which is a matter of importance when only small engines are in use.

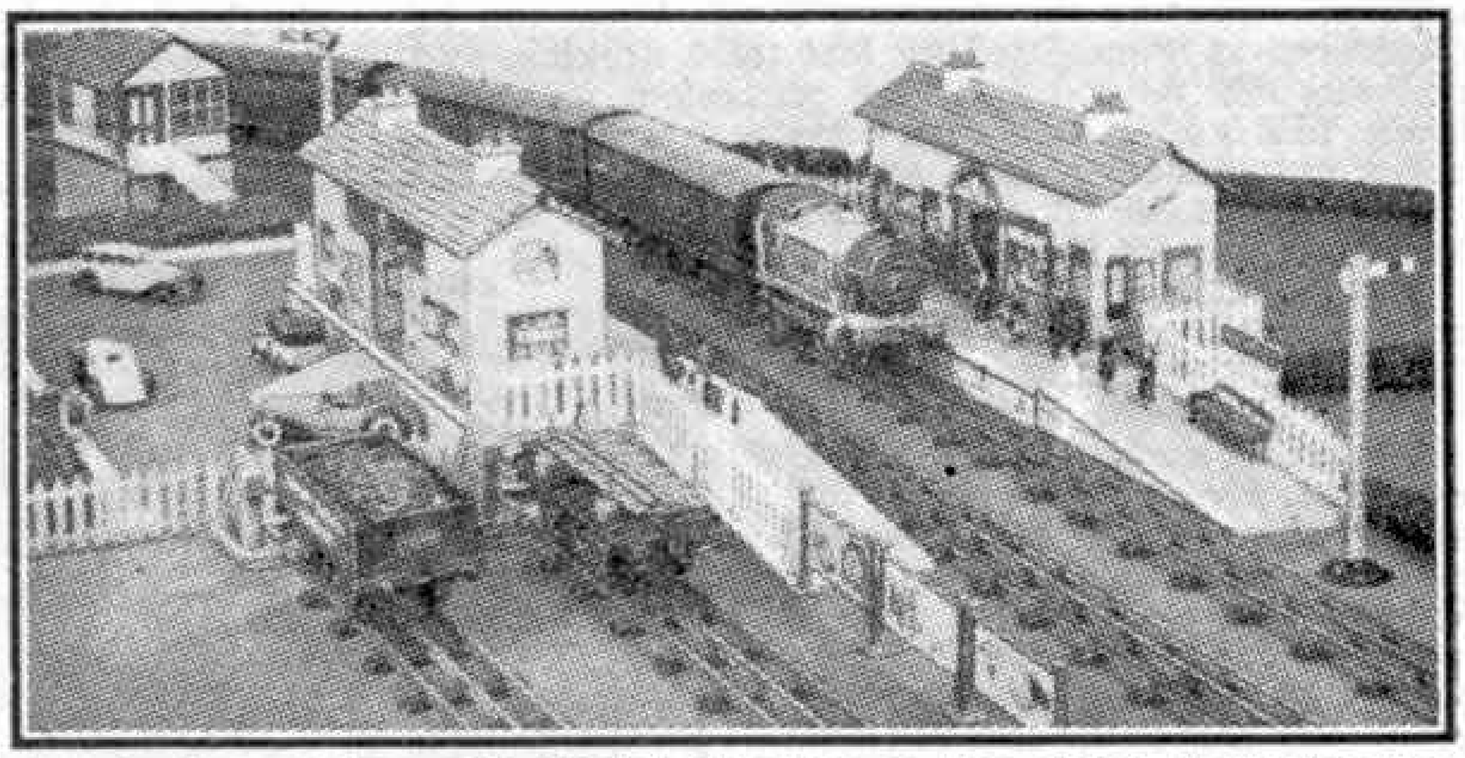
Timber and Lumber Wagons of the No. 2 type are respectively provided with loads of sawn timber and round poles. If these have been lost it is not difficult to provide substitutes. Model logs or "tree trunks" can be prepared from sticks of suitable size, taken from actual trees or hedges, and the real appearance of these loads is a great advantage. Owing to their irregular shape they may need to be secured by fine chain or cords; and it is a good plan to slip a small elastic band round a "parcel" of model logs to keep them in place while the chains or cords are being fixed up. Meccano Rods can be used for a load of steel bars, and they also make quite effective tubes or pipes.

For general cargo, blocks of wood can be shaped up to represent cases, and so on, the necessary details of boarding being marked on with a sharp pencil. Cartons of various kinds are not so common nowadays in the home, but there are still quite a few odds and ends that can be used as loads. Empty cotton bobbins, especially the short "fat" kind, make quite good drums. Strips of corrugated card make good sheets of corrugated "iron," especially if given a coat of silver or aluminium paint.

The standard containers of the Hornby Series will normally form the load of the useful Flat Truck, although it is possible to convey them in Open Wagons as is sometimes done in actual practice. To provide a realistic change in the contour of a freight train it is a good scheme to assemble a few odd items on a Flat Truck and to sheet them over with a Wagon Tarpaulin. The Flat Truck can be used also to convey miniature motor vehicles or such items as a farm tractor, military tanks or even guns.

As petrol restrictions do not apply in miniature, we can continue to carry miniature motor cars by rail when required, and for this purpose the best vehicle is the No. 2 Luggage Van. There is plenty of room inside it and the wide double doors make for easy loading. Actually it is possible to load two cars at a time in this Van. For easy transfer of the vehicles from the platform or loading "bank" to the Van, a piece of flat metal plate, thin wood or even cardboard, makes a satisfactory "ramp." Normally a Van thus loaded will be conveyed by passenger train; but if there is anything like a heavy traffic in motor vehicles, as there would be in normal times during the summer holiday period or in connection with a "Motor Show," a special train for motor traffic only can be run.

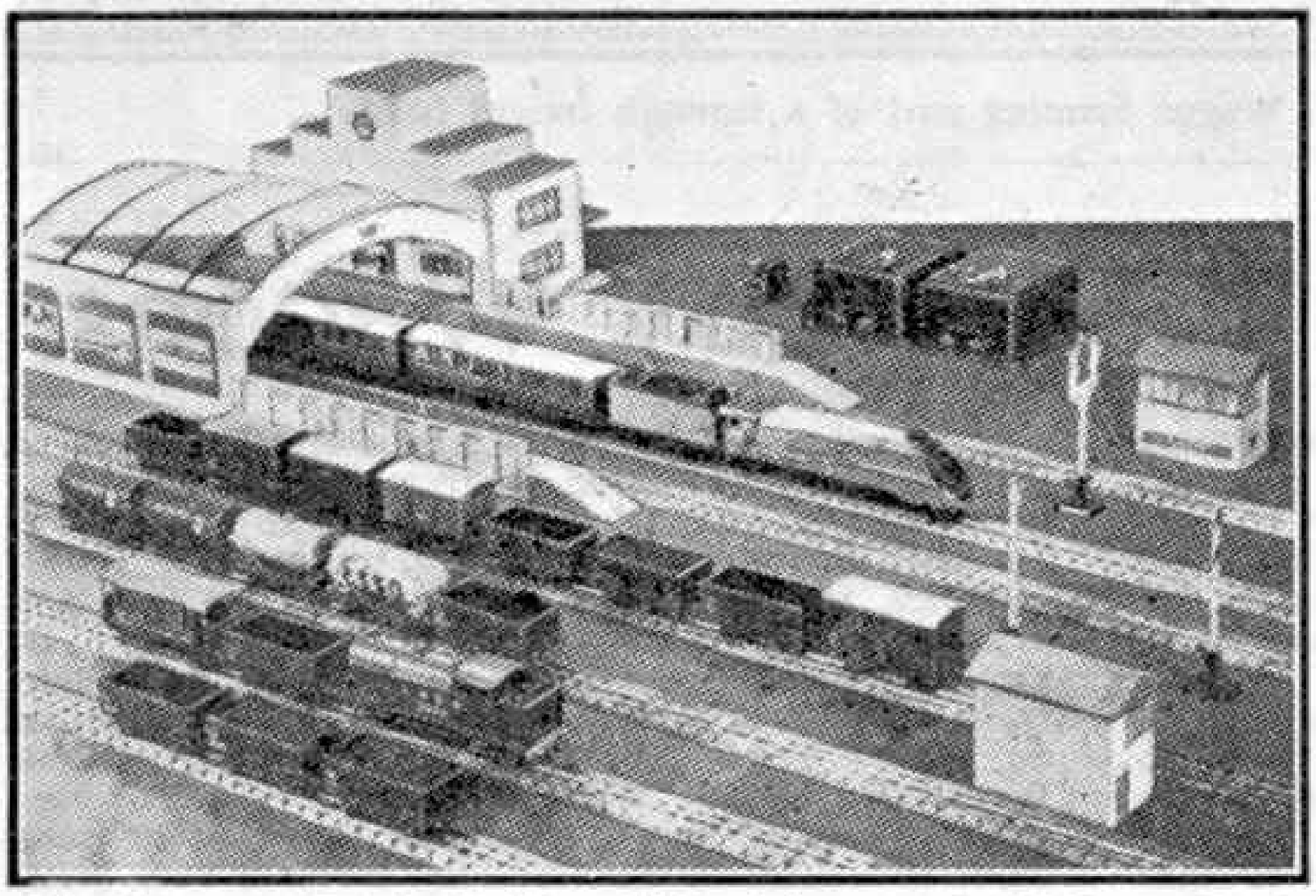
The miniature Milk Cans of the Hornby Series remind us of the importance of this traffic. The No. 1 Milk Van will generally be used, but if there is a large number of Cans there is no reason why the No. 2 Cattle Truck should not be employed. The latter has openings along the upper part of its sides, and makes quite an effective ventilated van suitable for milk traffic.



A suburban station with loaded Wagons in the siding, including the standard Coal Wagon.

Making up Hornby-Dublo Trains

IT is great fun to make up different kinds of Hornby-Dublo trains to carry the varying traffic that suggests itself to the imagination of the "Operating Manager." There is a good variety of stock included in the Dublo System, but as it is impossible to buy more vehicles at present, we must make the best possible use of those we are fortunate enough to possess.



Miscellaneous Hornby-Dublo vehicles being marshalled by a Tank Locomotive in the sidings outside a big station.

Taking the passenger traffic vehicles first we know that these are intended for main line long-distance work, as they are models of the standard corridor stock of the L.N.E.R. At the same time we can quite reasonably use these for slow and even suburban duties; main line stock is often used in this way, either as a matter of working convenience to move it from one point to another, or in order to fill up the time usefully in between longer-distance turns. The Two-Coach Articulated Unit makes a particularly good "suburban set," as its components stay permanently coupled; suburban trains on the L.N.E.R. are frequently made up of articulated sets.

Of the freight vehicles, quite a few of them are suitable for use on passenger trains. All the Vans, for instance, including the standard Goods Vans, can be considered as brake-fitted for fast train working, and therefore can be added to any convenient passenger train. This is often done with horse boxes and similar vehicles, so that the Dublo Horse Box or Cattle Truck can be used in this way.

Fish, meat and similar vehicles are usually run in complete "perishables" trains, and this can be done in miniature where there is a sufficient number of these Vans available. Even if there is only one or two they can be supplemented quite well by the standard Goods Vans in order to assemble a train of respectable length. The standard Vans can be used to represent practically any of the special traffic vehicles if required, especially in these days when new material is not obtainable. The common use of rolling stock between the different railways also makes it possible to run quite a mixture of vehicles in the same train, where in normal times the vans would all belong to the system working the train.

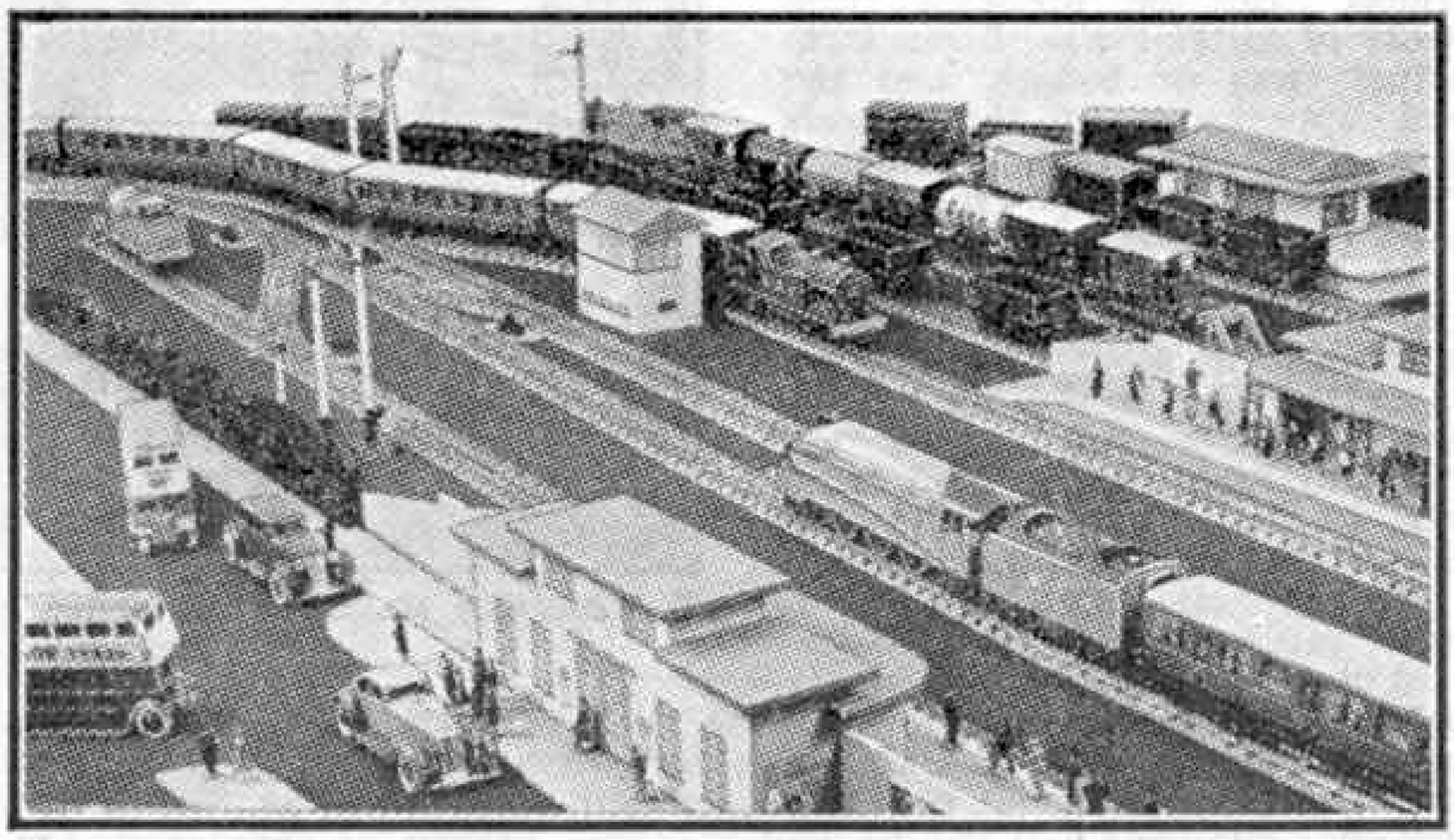
Nowadays even the engine and the brake van may belong to two different companies, and be attached to a train of mixed vehicles travelling over the metals of a third system!

The brake van forms a necessary part of any freight train whether fitted with automatic brakes for fast working or not; the Dublo Goods Brake Vans are excellent representations of the standard vehicles of the main line systems, and can be found plenty of work in miniature. In addition to its ordinary use, the Brake Van can form a "train" on its own occasionally, when an engine sets off on a "pick-up" trip to collect wagons from various sidings, or perhaps a complete train that has been loading or unloading at a depot. This interesting use of an engine and van is particularly effective in miniature.

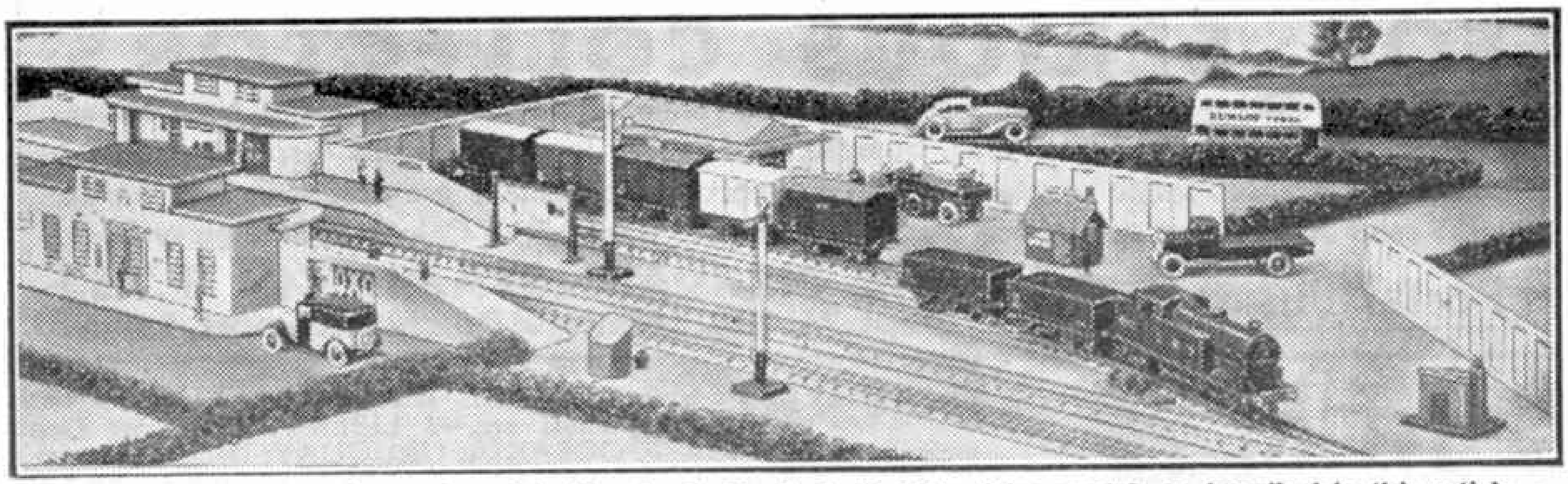
We may class the Tank Wagons of the Dublo System as "special purpose" vehicles, although oil or petrol tanks are not normally fitted for fast working. Important precautions regulate their use in view of the dangerous nature of their cargo when loaded. One that affects miniature train formation is the rule that such tank wagons should be conveyed in the centre of the train, so that they are as remote as possible from the effects of head-on or tail-end collision.

An ingenious scheme adopted by several readers in order to increase the apparent variety of their stock has been to paint or rather enamel the tank portion of a Standard Tank Wagon white, and then decorate it with the lettering of one of the big dairy concerns operating with tank wagons. If neatly done the effect is very striking, and as milk trucks are fitted for express working our converted vehicle can be run in a "perishable" freight express or even as part of a passenger train.

The "general service" stock of the real railways is represented by the different Open Wagons, and these can therefore find a place in almost any Dublo goods train. There are also the similar but loaded Coal Wagons and the special High-Sided Coal Wagons. Used together the three types allow a realistic mineral train to be assembled. Another vehicle of open type is the High Capacity Wagon, which reproduces exactly the bogie brick wagons of the L.N.E.R. Although really intended for brick and similar traffic, the model can be pressed into use on a coal train.



Express and suburban trains are shown in this illustration, also a train of mixed empty wagons.

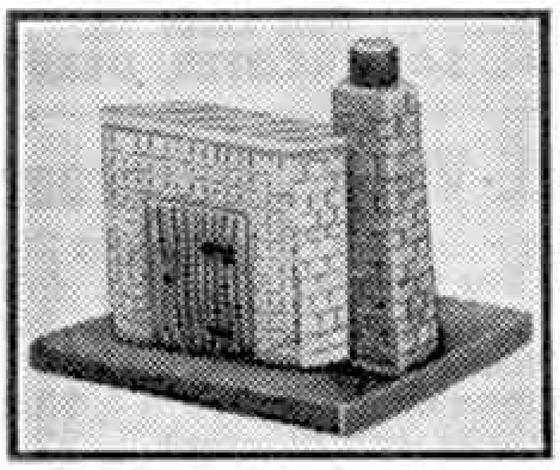


A typical country station and yard in Hornby-Dublo, including Plasticine models as described in this article.

Plasticine Accessories on a Dublo Railway

NO miniature railway looks really satisfactory without a few accessories placed here and there. They give "life" to the whole layout. The Hornby-Dublo system includes some useful accessories, but owing to the war these cannot now be bought, and most of us have to look round for some means of adding to the accessories we already possess, by making models of our own.

In past issues we have given hints on making larger accessories, such as bridges, out of wood or cardboard. Small items also can be made of these materials, but our correspondence shows that many readers find such work difficult and the results unsatisfactory. We have been experimenting recently with Plasticine for this purpose. Fortunately this wonderful modelling material is still available, though in restricted quantities. The picture on this page representing a country station and yard includes three Plasticine models that add greatly to the general realism, and in this article we describe briefly how they were made.



Platelayer's Hut.

First of all we have a familiar lineside object, the fogman's hut. This is used to shelter the fogman, whose job it is to place detonators or "fog signals" on the line as an indication to drivers of the state of the road ahead. To provide a little warmth for the men on this cheerless task a brazier, in which there is a healthy fire, stands outside the hut. Our model consists of a small hut, to approximately the standard Dublo scale, with an open front which is best made by shaping a piece of Plasticine to the required dimensions. A smooth piece of wood giving a clean flat finish is the best "tool" for this purpose. Next, the interior of the hut is chiselled out with a penknife, care being taken to keep the sides and back an even width. The seat is then fitted into position and the roof added, using for the latter a different colour to give the hut a most attractive appearance. The roof should project about ½ in. all round. Markings to represent boarding are then added with the point of the penknife blade.

The brazier, or fire bucket, is made of a small piece of Plasticine rolled into shape, slightly tapering in from top to bottom, with tiny pieces of coal or coke on the top. Draught holes round the sides are made with the penknife.

The general effect is most realistic, especially if one of the Dublo miniature figures is placed in a suitable position by the hut to represent a fogman.

Another interesting model is seen near the siding points in the illustration. This is a platelayer's hut, as used by the permanent way staff for storing tools and appliances, and for meals. The construction is similar to that of the fogman's hut, different colours of Plasticine being used for the hut itself, door, chimney, chimney-pot and base. Markings to represent brickwork and panelling on the door are again done with the penknife. The hinges and knob are drawn in with an ordinary pen in black ink. The outside chimney stack is made in its complete state first of all, and then a portion of one side is cut away so that the chimney can be fitted neatly in position with the top part overlapping the roof as shown.

Fogman's Hut.

The third model is rather more elaborate and, conforming to scale, is bigger than the other two. It is a model of a coal office, a familiar sight in most goods yards. In the coal merchant's office orders are taken and the unloading of coal from railway wagons into delivery vehicles is supervised. The same method of making this model is employed as already outlined, different colours of Plasticine being used for the various parts. Flat strips of light-coloured Plasticine are used for the window, notice board and coal office sign on the top of the roof. Here again the markings and letterings are done with an ordinary pen and black ink, as also are the hinges and knob of the door.

Coal Merchant's Office.

There is an extraordinary fascination in making these models, and with a little ingenuity it is surprising what realistic results can be obtained. In later articles we hope to describe further models. In the meantime we shall be glad to hear from any model railway enthusiasts who have already tried their hands at lineside models in Plasticine, and to pass on their hints and suggestions to readers in general. Good photographs would be particularly welcome.

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Other Stamp Advertisements on pages 140 and v.

Stamp Collecting

Watch What You Buy

By F. E. Metcalfe

THERE appeared recently in an American philatelic paper an article from one who, no doubt remembering past happenings, wanted to warn collectors against rushing in at the end of the war to buy stamps, perhaps at fancy prices, which have been turned out in millions by Germany since the war started in 1939. The writer went on to say that, as soon as they are allowed, certain American dealers will "clipper" to Europe with pockets full of dollars and return with reams of stamps, which will be unloaded on eager collectors, who will be quite unmindful of how they were caught before.

The warning was of course intended for home consumption, but we in this country also will be well advised to take it to heart. The danger is real enough, for after the last war collectors here spent thousands of pounds on stamps which would not bring as many hundreds to-day. And this for trumpery-looking specimens without any of the artistic merits of most modern issues

Forewarned is said to be forearmed, but such is the draw of attractively produced stamps amongst many collectors, as any dealer can testify, that they will have to be very much on their guard if they are to keep their money in their pockets.

All this is very well known to Nazi Germany, and right from the moment they came into power they took full advantage of the propaganda value, as well as the revenue-earning possibilities, of well-produced postage stamps.

Of course Germany is not the only country aware of this. As a matter of fact all countries except one have shown that they know all about it.

As we have said, all except one, and that is the country which gave birth to the adhesive postage stamp — Great Britain. But whereas other governments have been content to issue postage stamps, Germany has gone one better—or worse shall we say—and since 1933 has taken an active interest in philately itself.

And here let us say that had we to choose between the apathy of our own government to all matters philatelic, and the very-much-aliveness of the Nazis, we would plump all the time for the former. For stamp collecting, as far as we are concerned, is a hobby, a form of escapism if you like, and that's how we want it.

One can be quite sure that the Nazis were not concerned about the welfare of stamp collectors as such. No; what they cared about, apart from the cash they made out of the sale of stamps themselves, was the placing of their mark on every German activity, with their own ends always, and only, in view.

The Nazis came into power in 1933, and by 1935, when the International Stamp Exhibition was held in Koenigsberg, more than half of the many stamp clubs in Germany had already been roped into the National Reichbund of Philatelists, thus coming directly under government control. Even stamp dealers, if they happened to be Jewish, were feeling the pressure, and those important enough to issue their own house organs were only allowed simple price lists instead.

New issues poured out, generally attractive, and issued with one eye on the collector's pocket and the other on the propaganda value of the stamps themselves. All this has been going on apparently until the present day, and will no doubt thus continue so long as there are sufficient "collectors" to pay good money for gummed labels.

As the Nazis were alive to the possibilities of stamps when they assumed control of their own country, they did not overlook them when they invaded their neighbours. A beautiful set, with a portrait of Queen Wilhelmina, had not been on issue long when the Germans marched into Holland. Of course these had to go, for to say the least of it, the Netherlands queen was not exactly *persona grata*, and stamps previously in use were reissued, after they had been surcharged.

Norway's stamps below the 1k. value were perfectly innocuous in design, so they were allowed to remain in use; but those from 1k. to 5k., bearing a fine portrait of King Haakon VII, were withdrawn at once.

Poland's attractive stamps were so heavily overprinted with the German eagle, etc., that little of the original design remained visible, and some time afterwards even these were replaced by stamps bearing the inscription "General Government," as can be seen from our illustration.

Apparently Poland is no longer entitled to a name, but its day will come, and in the meanwhile readers might like to speculate what Russia will do to German stamps when they get to Berlin.

Our own empire has never produced more beautiful stamps than it is doing to-day, contrary opinions of vested interests notwithstanding; and amongst those collectors who have paid current prices for old colonials, or foreign pictorials, or George VI colonials, we know who will be smiling most broadly a few years hence—it won't be collectors of the two former groups.

Be all that as it may, nobody has a right to dictate what another shall not collect, for it is a hobby we are concerned with, and that is entirely a personal matter; yet in view of subsequent disappointments which collectors of New-Europe stamps experienced after the last war, may we say "*Watch your step.*"

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Estonia ...	15	25	35	Portugal ...	30	50	80
Finland ...	20	40	60	Roumania ...	25	40	90
France ...	35	60	100	Russia ...	20	40	70
Germany ...	50	100	150	Spain ...	30	50	75
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Other Stamp Advertisements on pages 138 and v.

Stamp Gossip
and Notes on New Issues

We have only two entirely new colonial stamps to report on this month, and these are the 1d. and 1½d. stamps from Australia. Both bear the same portrait of Queen Elizabeth, though the rest of the designs differ somewhat. The flowers shown on the 1d. value bear the very Australian name of kurrajong, whilst those on the 1½d. stamp are said to be known as the flannel flower, whatever that may be.

The stamps are rather attractive, but just a bit overcrowded, and incidentally they replace others which have had a very short life. Collectors of Georgian colonials please note.

As long ago as 1st October of last year the Crown Agents advised that new printings of Gilbert and Ellice Is. and British Solomon Islands were in preparation, but they have not yet shown up and we are writing early in March. We should not be very surprised if they never did, at least in their original colours, for news has been trickling through that many of these stamps have been looted by Japanese soldiers, who have landed at some time or other on both groups of islands.

It will be remembered that when the Italians invaded British Somaliland, which seems hard to believe in these days, the authorities at once demonetized their stamps, and brought out an entirely new set when the Italians were rounded up. In view of this very sensible precedent, collectors got a shock when the reprints were announced, and prices, which were several pounds a set, tumbled down to about one third of what they had been. Buyers at these latter prices may have done well for their collections.

The new printings of Swaziland are out, and have proved to be pertorated 13½ × 14, so they have of course been listed. It is only a few weeks since a new perforation, Perf. 14, was catalogued for the 1½d. value, and a new shade for the 3d. Collectors of this group will still be able to pick these up for a few coppers, but not for long.

In the foreign field we have one or two very interesting stamps to report. One comes from Finland, in an attractive shade of blue, and as can be seen from our illustration of this stamp the design is very effective. It is line engraved and this improves its appearance.

Madagascar also provides us with some imposing stamps. The large one we illustrate is part of an air set of three issued to raise funds for child welfare. Unfortunately we have not room to show the other two, though they are well worth it.

We are also able to show one of the latest sets of Free French issues, also for use in Madagascar. There are 14 stamps in the set, which go from 5c. to 20f. and whilst the colours are bright enough, the design hasn't much to commend it. The set itself is nevertheless very welcome, for it denotes that yet one more French colony is on our side.

Modern issues of France had a great vogue amongst collectors whilst supplies were available, and deservedly so, for not only were they cheap, costing as they did rarely more than a few coppers each, but from a technical and artistic standpoint they were hard to beat. In fact some of those "classical" issues we hear so much about made a very poor show when placed alongside them.

Gibbons have increased many of their prices, but we recently studied a French catalogue issued last year, and so astounding are some of the prices apparently ruling in France, that we thought some of our readers—we are sure that there must be many who collected the stamps in question, so popular were they—might like us to quote a few.

The numbers are those of the last "big Gibbons." The first price given refers to mint and the second to used; where there is only one it refers to both mint and used. So off we go: No. 516, 60f., 55f.; No. 520, 400f., 27.50; No. 526a, 135f., 50f.; No. 543, 47.50, 1f.; No. 553, 65f., 17 50; No. 554, 1600f., 900f.; No. 559, 35 f., 37.50; Nos. 585-6, 200f., 125f.; No. 608, 100f.; No. 595, 25f.; No. 611, 100f.; No. 614, 75f., 70f.; No. 617, 50f.; No. 640, 20f.; No. 642, 50f.

We could quote lots more, but we have probably given enough to show how much more these stamps cost in France than they do in Great Britain.

Our last illustration refers to a stamp from a delightful set of six issued for use in Curacao. Whatever French people may think after the war when they see what stamps we printed for their colonies, we think that the Dutch people at any rate will be satisfied. The values in the set are 1c., 1½c., 2c., 2½c., 5c. and 6c. The one we illustrate is the 2c. value, which gives a general view of Saba, one of the islands of the Curacao group. Saba has an area of only 8 sq. m. and occupies the crater of an extinct volcano.

Sir Humphry Davy—(*Continued from page 126*)

lamp glass, with gauze mounted above it in order to allow for the escape of the products of burning. In various developments of this new form the Davy lamp continued in use, undoubtedly saving thousands of lives as mines were driven deeper and gas accumulations became more threatening; and in fact it reigned supreme until the coming of the electric accumulator or battery.

It is interesting to find that in his invention of the miner's safety lamp Davy had a rival in George Stephenson, the famous locomotive and railway pioneer. Stephenson began his career as a colliery engineer and he was appalled at the loss of life in explosions in mines in the North. He cast about for means of providing safety lamps, and independently of Davy discovered that very fine tubes did not allow the passage of a flame. His first lamp admitted air through narrow openings, and later he also made use of wire gauze. Unfortunately a fierce quarrel arose between the supporters of Davy and Stephenson, each set claiming the sole merit for the invention for its own representative. Now we can give full credit to both for their discoveries and for their practical application. For his share Davy was given a present of plate by the coal owners, and he nobly refused to take out a patent for his invention, which he placed freely at the service of the miner in order to guarantee him safety in the pursuit of his calling.

In 1818 Davy was created a baronet, and he then made a further trip to the Continent. In 1820 he became President of the Royal Society, a position that could be regarded as the foremost of a scientific character in the country, and he continued his experimental work in chemistry and in other branches of science, especially in electricity. These experiments led him to devise means of protecting the copper sheathing of sea-going ships, which rapidly corroded. He realised that the problem was electrical in character, since sea water acts only on positively electrified copper. This led him to advocate the use of plates of zinc or iron attached to the copper, which in effect gave a miniature electric cell in which the fluid was sea water and the copper was slightly negative. Plates of copper protected by the attachment of iron or zinc in this manner certainly remain free from corrosion even after prolonged immersion, and naval and other vessels were equipped in this manner. Unfortunately it was found that seaweed and shell fish accumulated in such quantities on the bottoms of protected ships that sailing was seriously impeded, and the plan had to be abandoned.

By this time Davy's health had declined, and he was advised to leave England for the Continent. From 1826 onward he was almost continuously abroad, staying in the Tyrol, in Illyria and in Italy. Although he was ill he retained his scientific interests, and while living in Rome he submitted a paper to the Royal Society on the electricity of the torpedo, one of the strange fish that are capable of giving electric shocks. He died at Geneva on 28th May, 1829.

O.K. for Flight—(*Continued from page 114*)

radio of all-clear.

So far as Ship 121 is concerned, our job is done. Except maybe for a final retouch later, when this shakedown flight is concluded.

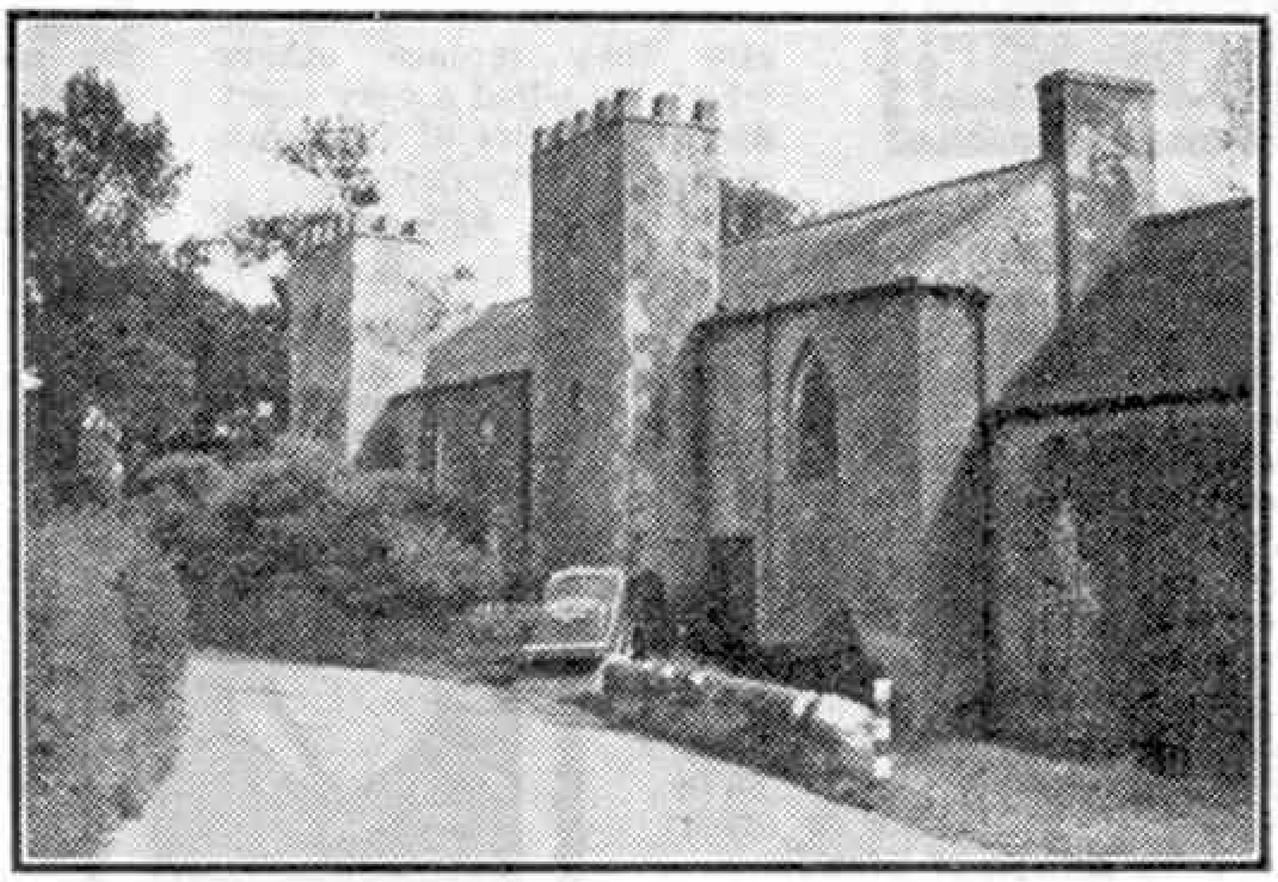
Before turning to the next ship, however, we steal one guilty moment of inaction to follow our sinister warbird rising in splendid triumph to its element. Shoulders squared in a vast pride of craftsmanship, throats a little tight and eyes agleam, we watch it race away, gathering speed, more speed, faster and ever faster, now in the air, climbing, joyously spreading its strong wings of victory over the Pacific.

Escaping the Japanese Invader—(*Cont. from p. 127*)

of accomplishing this was not very good, as right in front of them was a big hill, and either they must clear this or turn away from it immediately they were off the ground. To go over the hill in an overloaded aircraft was almost an impossibility, and also they would run right into the Japanese bombers which were then heading towards them. So immediately the machine was airborne they turned and headed out to sea as fast as they could. Two of the Japs dived at them, but missed, and the Lockheed was able to keep out of range and gradually drew away from them.

For the last several hundred miles of the 8-hr. flight to Colombo in Ceylon the soldiers poured petrol down through the hose into the wing tank, while the old machine thundered across the shark-infested waters of the Bay of Bengal.

Not the least remarkable thing about this memorable flight to safety is that the young pilot had only 250 flying hours to his credit. If he had had 500 he probably would have known too much about aircraft to have had the nerve to attempt it, commented van Hoogland.



Castle Mill, a Nottinghamshire water mill that stands on the site of one mentioned in Domesday Book, This historic mill is mentioned in an article on page 129. Photograph by F. Rodgers, Derby.

HOME STUDY WITH THE I.C.S.

Whatever his occupation, from advertising and aeronautical engineering to textile manufacture and woodworking, a boy or young man can now receive invaluable training from the courses arranged by the International Correspondence Schools, which have had a career of unchecked success since 1891. This success is due to the efficient and practical plan of technical education then devised and put into operation.

Every branch of engineering, commerce and industry is covered by the courses, together with languages, salesmanship, art and architecture. The medium of instruction is a series of Manuals supplied to the student as he progresses with his course, and in addition a reference library consisting of several volumes is sent to him on enrolment. Each student forms a class of one, so that he receives individual attention, and a complete record is kept of his progress to assist the tutors in making sure that he thoroughly understands every point and can apply it.

Besides the standard courses special courses are arranged to suit exceptional circumstances, and preparation can be given for practically any professional or technical examination. Full information can be obtained from any branch or on writing to headquarters at Dept. 218, International Buildings, Kingsway, London W.C.2.

Competitions! Open To All Readers

What is Wrong Here?

JUMBLED LOCOMOTIVE DETAILS

	NAME	CLASS	DESCRIPTION	CYLS.
1.	"Dover"	Merchant Navy, N.E., 4-4-0	Has chromium-plated wheels and motion	3
2.	"Robert Blake"	Hunt D49, S.R., 2-6-0	Streamlined	3
3.	"Union Castle"	Castle, S.R., 4-6-2	For light express duties	4
4.	"The Bramham Moor"	Jubilee, G.W., 4-4-0	Built in 1923	4
5.	"Silver Jubilee"	Mogul "K4," L.M.S., 4-6-0	For express Pullman trains	3
6.	"Lord of the Isles"	Princess Coronation, N.E., 4-6-0	Has an attractive nameplate	3
7.	"Caerphilly Castle"	Lord Nelson, S.R., 4-6-2	Mixed traffic locomotive with large cab over rear coupled wheels	3
8.	"Duchess of Gloucester"	Schools "V," L.M.S., 4-6-0	"Air-smoothed"	4

Most railway enthusiasts take a special interest in named locomotives and our contest this month gives them a chance to test their locomotive knowledge. In the panel on this page are the names of eight well-known locomotives, with certain descriptive details in each case. These details are not in their correct places, however. Everything has been mixed up and competitors are asked to sort out the mass so that the correct descriptions are given for each locomotive.

For their entries readers should make out a list of the locomotive names as given in the first column, and should then add the correct details. The list should then be forwarded to "*April Jumbled Locomotive Details Contest, Meccano Magazine, Binns Road, Liverpool 13,*" and competitors must not forget to write their names and addresses clearly on each sheet of their entries.

Every reader of the "*M.M.*" is eligible for this contest, which as usual is divided into two sections, for Home and Overseas entrants respectively. In each of these sections prizes of £1/1/–, 10/6 and 5/– will be awarded, and in addition there will be consolation prizes for other meritorious efforts. The closing dates are 30th April in the Home Section and 31st August in the Overseas Section.

A Stamp Picture Contest

Recently we were interested to see very attractive and effective coloured pictures that on closer examination proved to be built up of fragments of stamps. The stamps employed were very ordinary ones taken from letters. Postmarks offer no difficulty in making pictures in this way, for much of the surface of most stamps used in the post is free from them, and indeed effective use often could be made of postmarked fragments.

While examining these pictures it occurred to us that here was scope for a very interesting "*M.M.*" contest in which all readers could join, for the materials are available to everybody, and the very ordinary stamps available provide a good range of colour. We therefore invite readers to see what they can do. Entrants in this contest may either try to reproduce some coloured picture with which they are familiar, or they may make up a suitable coloured scene for themselves. There is no limit to the range of stamps that can be introduced, so that those who have surplus stamps of other countries in their own collections can make good use of them. Fragments of any size or shape can be used as required in making up an entry, but nothing beyond pieces of stamps must be used. It is best to choose a picture or scene in which there are no large areas of sky or water, which might offer difficulties because of the absence of deep colour. If these are introduced at all they should just be left white, unless a deep blue sea is to be included.

Our readers will find it great fun to reproduce pictures in stamps in this manner. The prizes will not necessarily go to the largest and most elaborate productions, or to those in which the most valuable or largest range of stamps are used, for the judges will look for ingenuity and skill in cutting up the stamps and adapting them to this novel purpose.

Competitors must remember to put their names and addresses, with their ages, on the backs of their entries, and these should be addressed "*April Stamp Picture Contest, Meccano Magazine, Binns Road, Liverpool 13.*" There will be two sections, for Home and Overseas readers respectively, and in each prizes will be awarded of £1/1/–, 10/6 and 5/–. We are sure that there will be a very large number of excellent entries, so we are adding a number of consolation prizes for efforts that deserve recognition, but do not quite reach the standard of the principal prize-winners. The closing dates are 30th April in the Home Section, and 31st August in the Overseas Section.

April Photographic Contest

This month's photographic contest is the 4th of our 1943 series, and in it, as usual, prizes are offered for the best photographs of any kind submitted. There are two conditions—1, that the photograph must have been taken by the competitor, and 2, that on the back of each print must be stated exactly what the photograph represents. A fancy title may be added if desired, but entries in which the second condition stated above is not observed will be disqualified. This is very important. Excellent entries in recent contests, most of them scenes in the countryside, in mountain country, or on the seashore, failed to win prizes because their senders did not state exactly where they were taken.

Entries will be divided into two sections, A for readers aged 16 and over, and B, for those under 16. They should be addressed "*April Photo. Contest, Meccano Magazine, Binns Road, Liverpool 13.*" There will be separate sections for Overseas readers.

In each section prizes of 15/– and 7/6 will be awarded, together with consolation prizes for other good efforts. Closing dates: Home Section, 30th April; Overseas Section, 31st August.

Fireside Fun

Customer in post office: "And must I stick the stamp on myself?"

Assistant: "Better not, madam. It will be more useful on the parcel."

* * * *

"Tramps like you should go to work somewhere. Remember, a rolling stone gathers no moss."

"What use is moss to a man in my position, mum?"

* * * *

"Well, Pat, have you counted all your sheep?"

"All but the little one, boss. It ran about so much that I couldn't count it at all."

* * * *

"I don't see why the men grumble, sergeant. This soup is excellent."

"They wouldn't grumble if the cook would admit it was soup, sir. He will insist that it's tea."

* * * *

Schoolmistress: "Now Tommy, what do we do with the whale?"

Tommy: "Eat it, miss."

Schoolmistress (sarcastically): "Oh, indeed. And what about the bones?"

Tommy: "Put them on the edge of the plate, miss."

* * * *

Barber: "This man wants a shave."

New Assistant: "Let me practise on him."

Barber: "All right. But be careful and don't cut yourself."

* * * *

Patient (paying account): "I think your charges have been very reasonable, Doctor."

Doctor: "Thank you. I always try to bring illness within easy reach of all my patients."

* * * *

Father: "When you are my age, my boy, you'll realise that your schooldays were the happiest times of your life."

Small Son: "Gosh, what a terrible future I've got."

* * * *

"Was that policeman ever a baby, mummy?"

"Of course he was."

"I should love to see a baby policeman."

* * * *

BRAIN TEASERS

CRAZY ARITHMETIC

Can you take 10 from 40 and leave 50, or add 100 to 10 and get 90? If you can you will have no difficulty in taking away 5 from 4 and leaving 1, or in making up 115 by multiplying together 100 and 5. Finally add together 1,000 and 500; the answer should be a very high degree.

* * * *

THIS WANTS WATCHING

Which would you rather have, a watch that is right twice every day, or one that is never right at all?

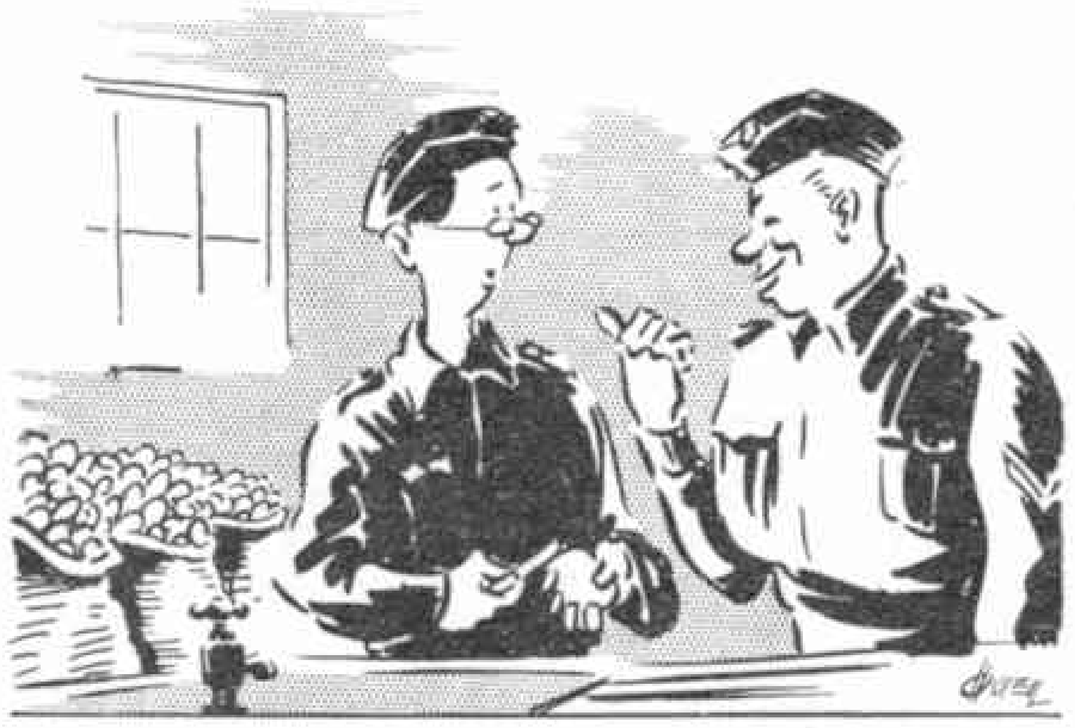
(T.K.C.)

A TIME PUZZLE

An airman who was at Apia, Western Samoa, in the Pacific Ocean, was instructed to make a return flight to Auckland, New Zealand. He left Apia at 10 p.m. on Wednesday, 10th February, and flew at the rate of 150 m.p.h., this representing his ground speed throughout the double trip. The distance between the two points is 1,575 miles, and the pilot rested at Auckland for 13½ hrs. after his arrival there before beginning the return trip. At what times and on which days did he arrive, first at Auckland and second at Apia?

This looks like a simple calculation, but there is a neat catch in it, so be careful.

* * * *



"I thought the Army had potato-peeling machines," complained Private Smith when set to work in the kitchen.

"It has," replied Sergeant Flagg. "And you're the latest model."

* * * *

THE KEYWORD IS THE ANSWER HERE

Can you find a keyword of seven letters that will make the following sum right when the correct numbers are substituted for letters?

$$\frac{E}{R}Y + \frac{R}{D}E = \frac{E}{R}Y \times \frac{R}{D}E = \frac{E}{WK}O$$

The numbers represented by the letters of the codeword, taken in order, are 0 to 7.

* * * * (C.B.D.)

SOLUTIONS TO LAST MONTH'S PUZZLES

The word that provides the solution to our first puzzle last month is DEIFIED. This is what is known as a palindrome, that is a word that reads the same forward and backward. From this it will be easy to realise that the solution contains the word 12 times, since it appears in six lines and can be taken both ways along each.

For the solution of the snail climbing problem we turn to our old friend Pythagoras and his famous theorem on right-angled triangles. If the snail climbed the tree straight upward it would travel 12 ft.; if it simply went round the tree 12 times it would travel 5 ft. As it combines the two movements it moves along the third side of a right-angled triangle, and the square of this third side is equal to the sum of the squares of 5 and 12. This third side is easily worked out to be 13 ft. in length. Thus the snail travelled 13 ft., or 156 in., and so it took 156 min. to reach the summit of its ambition.

* * * *

THIS MONTH'S HOWLER

"What is the height of Mont Blanc?"

"You can make it any height you like, according to the mould."

FURTHER NEW

"SCALELINE" PLANS

AEROPLANES——SHIPS

SCALELINE Plans are officially recommended by Government for "Wings for Victory" War Savings Campaign. Thousands of Models are being made from them in all parts of the country. Over 50 Plans of Aircraft and Ships are already released. Here are recent additions.

'Planes 1/72nd scale:

LOCKHEED HUDSON	9d.
AVRO MANCHESTER	9d.
LANCASTER	1/-

Ships 50 ft. to 1 in.:

CRUISER, H.M.S. SOUTHAMPTON	9d.
A/C U.S.S. HORNET	1/-
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Please refer to list published in "M.M." February issue, or send 2d. for complete list to Modelcraft Ltd., 77 (M.M.), Grosvenor Rd., London S.W.1.

BINDING THE "M.M."

Binding cases for the 1942 "M.M." can be obtained from Messrs. O. H. Bateman and Co., 23, Hanover Street, Liverpool 1. They are supplied in what is known as Quarter Basil, full cloth, and are tastefully embossed in gold with the name "Meccano Magazine." On the back is the name and volume number. Price 6/6 post free.

These binding cases are supplied so that readers can have their Magazines bound locally, but where desired the firm mentioned above will bind the twelve issues of the 1942 "Meccano Magazine" at a charge of 10/- including the cost of the binding case and also return carriage. The covers of the Magazines may be included or omitted as required.

TRANSFORMERS

If you are interested in Meccano or Dublo Transformers, look out for the announcement on this page next month

CIGARETTE CARDS

ANOTHER SELECTION OF SETS IN POPULAR DEMAND

Churchman	... The Navy at Work	2/6
"	... Boxing Personalities	1/-
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"	... Wild Flowers (2nd series) ...	1/3
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Player	... Birds and Their Young ...	1/-
Gallaher	... Dogs...	10½d.
Phillips	... Famous Crowns	10½d.

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of living eggs, caterpillars and chrysalides of British butterflies and moths.

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"THE BUTTERFLY FARM," BEXLEY, KENT

STAMP ADVERTISEMENTS

Continued from pages 138 and 140.

THOSE GAPS must be filled, ask for Colonial approvals ½d.—6d. and enclose 2½d. postage. Purcell, 22, Green Lane, Amersham, Bucks.

K.G.VI SHORT UNUSED SETS
ON APPROVAL

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	"00"	"0"
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WATERLINE SHIP MODELS:		
CORVETTES ... 5½ in. ...		2/11
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Postage and Packing 4d. extra.

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1943 HOBBY LIST

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